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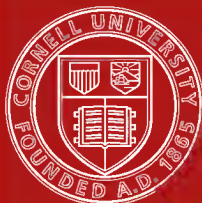
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NEW LANDS:

THEIR RESOURCES AND PROSPECTIVE ADVANTAGES.

BY

HUGH ROBERT MILL,

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BEING THE INTRODUCTORY VOLUME OF

GRIFFIN'S "NEW LAND" SERIES,

EDITED BY PROF. GRENVILLE A. J. COLE, M.R.I.A., F.G.S.

WITH TEN MAPS.



LONDON:
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EXETER STREET, STRAND.
1900.

P R E F A C E.

IN acceding to a request to write for Griffin's "New Land" Series for Prospectors, a volume on New Lands, it was the desire of the author to present a short, simple, and practical account of the conditions of life in those parts of the world where there is still an opening for the energies of English-speaking people desiring to make their home or invest their capital in a new country. Considerations of space made it necessary to limit the scope of the survey, and it was found desirable to treat of little more than the countries of the temperate zone.

The only part of the book in which the author speaks from personal knowledge of the country is that dealing with the Dominion of Canada. The value of the brief visit which he paid to the far west lay mainly in enabling him to satisfy himself of the careful accuracy of the official publications regarding the western provinces and territories, and to form the acquaintance of public men and settlers whose information has been gratefully utilised.

With regard to the other colonies and countries dealt with, the author depended less upon official reports than on the writings and personal statements of independent residents or visitors. In some cases there was a conflict

of opinion, and in these an effort was made to give prominence to the evidence which appeared most trustworthy on account of the experience or independence of the witness.

One piece of advice is given by all practical men and cannot be too emphatically repeated. It is that no new-comer in any country should invest money or start any enterprise on his own account until he has resided some little time in the place and has become familiar with the peculiarities of the climate and resources, and with the mode of life which the experience of earlier comers has proved to be the best. In almost every case it will be found that the crux of a new land is the water supply. Water, as rain or rivers, is indeed the very life-blood of the habitable world, and the phenomena of its circulation are often complicated and require much study to elucidate.

Further information regarding the countries treated of may be obtained from the books cited in the various chapters, from the Colonial and Foreign Office Reports of the British Government, the annual official handbooks of the colonies published locally, and the publications of the various public departments of the countries. *The Statesman's Year Book*, edited by Dr. J. Scott Keltie, is the most compact and up-to-date annual repertory of statistics.

H. R. M.

1 SAVILE ROW, W.

July, 1900.

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NEW LANDS.

CHAPTER I.

INTRODUCTORY.

New and Old Lands—Hints to Emigrants—Personal Idiosyncrasy—
—Occupations in New Lands—Value of Experience—Educated
Women in New Lands.

EVERY country probably possesses some valuable and still undeveloped resources which promise a good return for labour, vigorously and intelligently applied. The old lands of Great Britain, which are slipping out of cultivation year by year, might possibly be restored to their former purposes by a judicious employment of capital in introducing, instead of grain crops, some form of industrial "raw material," which would thrive in the soil and climate. The Highlands of Scotland, which have ceased to support a population of sheep-farmers, are already being turned to fresh account by the utilisation of their abundant water-power as a source of electric energy for manufacturers. In this way invention and discovery may make "new" the oldest lands; but this is not the sense which we propose to attach to the word.

By "New Lands" we mean those which have not hitherto been fully exploited or settled, in which land can still be easily and cheaply obtained by anyone willing to work, and where a man may live in comfort, if not in luxury, enjoying freedom of opinion and of action, and where, finally, he can, if he likes, take part in shaping the destiny of a rising nation.

Political influences are, in almost all old countries, powerful in excluding or heavily handicapping foreign competition; and on this account we shall omit from consideration the whole of Europe, and of those countries in Asia and Africa which are

held and administered by strong nations of alien speech. In that category we may for the present leave the Chinese Empire; but we include in the scope of this book all temperate parts of the British Empire and of the United States not yet fully taken up—temperate South Africa, Australia, New Zealand, and such of the Latin-American Republics as are politically stable, yet lack the financial means or administrative strength to complete their own development. We do not, however, propose to treat the question from the financial point of view only, but rather from that of the full and permanent development and utilisation of a country. These can only be brought about by the permanent settlement therein of a working population, whose entire interests are centred in the land of their adoption. At the same time, the position of the investor who desires an outlet for his capital, and one which will yield a good return, will not be lost sight of; for capital is nowhere more essential to the success of labour than in the development of new lands.

In this volume an endeavour is made to bring together such information as to the countries of the future as will be best calculated to help the intending emigrant to decide where he can turn his natural ability, training, and enterprise to the best account. The descriptions cannot be exhaustive, for the practical considerations, which should be taken into account, are very numerous, and it is only possible to make this handbook useful by limiting its scope. Nothing is said regarding the vast fields for trading enterprise which lie on the point of becoming available in Eastern Asia, and nothing of such tropical countries, the development of which, by the capital of white men, necessitates the labour of the black. Both of these are legitimate and profitable fields of work, but they necessitate the consideration of different conditions and a different method of treatment.

No one should rest content with the information herein set forth if he intends to make practical use of it. He should supplement it by reading the books referred to in the description of the particular region in which he proposes to try his fortune. It is both wrong and foolish for any one to commence life in a new land ignorant of the country, its laws, and the customs of its people; but it is scarcely less dangerous to go out with cut-and-dried views derived from books alone. The most exact statistics of climate, for instance, may convey very little real idea of what the daily weather of a particular place is like; the formulation of the laws and regulations laid down

by authority cannot enable one to judge how far these may be enforced, or how their influence may be felt. Even official statistics may be imperfectly collected, and perhaps present facts in a more favourable light than strict impartiality might permit. It must be remembered that full and trustworthy statistics are the product exclusively of old and fully occupied countries. As far as possible, we shall endeavour to combine with the statements of official authorities the experiences of those who have lived in the countries, and are therefore able to judge. But it must be remembered that no two people have identical experiences, nor look at things from quite the same point of view.

It is, of course, to be understood that this book is intended for persons of some education and intelligence, who desire to take part in the development of new lands by professional enterprise, the direction of labour, or the employment of capital, and who are not afraid of taking their own part in any work which may be necessary. It is not intended for the mere labourer, nor for the man with neither practical knowledge nor the desire to work; for the latter, indeed, there is no land "new" enough to offer the life he would desire to live.

Certain general considerations of a personal character, which in themselves are trivial, may mean a good deal in practice, for little things are apt to bulk more largely than we care to acknowledge. Some of these may be briefly characterised.

Personal Idiosyncrasy.—No dweller in an old country can expect to carry with him to a new land the habits of his early life. These habits are the growth of that environment from which he desires to disentangle himself, in order to find fuller scope for his energies, and more result for his efforts. Luxuries, and even common comforts, must often be laid aside, and the less dependent a man is upon his ordinary surroundings the sooner will he be able to achieve the most effective results under new conditions. Hence the enormous advantage which the total abstainer and non-smoker has, at the outset, as a pioneer. On the other hand, the determination to obtain certain cherished luxuries may be powerful in overcoming difficulties with regard to communications, or in supplying incentives to work. Natural aptitudes and likings should not be neglected without real cause. Some men are better adapted by nature for a hot, others for a cold, climate; some suffer abnormally from the attacks of mosquitoes and other insects, just as some suffer abnormally from sea-sickness. To some the

deprivation of society is torture, while others are at their best in solitude. One finds the acquisition of a new language the worst of toils, another views it as a pleasant recreation. It is really of importance to recognise and distinguish between these individual constitutional peculiarities and the temporary feelings of discomfort induced by a change in one's habits and surroundings. Before a determined will the greatest natural difficulties may be forced to give way; but, in most cases, the necessity of fighting against a constitutional antipathy or predilection means a great increase in the chances of failure.

Occupation.—The best prospect of success in a new land will probably be found in the exercise of a familiar occupation, provided that it is one adapted to the new conditions of life. The trained agriculturist will succeed best in farming, and the miner in a mine; a medical man will probably do best in his own profession, when he has adapted himself to the changed conditions of the place. Still, it is by no means so necessary for the shoemaker to stick to his last in a new, as in an old land. High specialisation in most branches of industry is only possible in old or highly developed communities. On gold-fields which are sufficiently developed to admit of the use of machinery, specialists in the processes of gold extraction have, of course, better prospects than those who have to learn the work. Where population is scattered and work scarce, a certain facility in passing from one occupation to another is exceedingly valuable. The man who can turn his hand to anything usually gets on best in opening up new lands; but when development of a country fairly sets in, the man who has had technical training in some one useful art comes most rapidly to the front. To know something of everything and everything of something is, in fact, the best preparation for the pioneer in the formative work of a new land, as for the cultured conversationalist. If one profession more than another will fit a man to be a good pioneer in a new country, it is that of an engineer—mining, mechanical, or civil.

The great personal qualities for a pioneer to possess are perseverance and adaptability. There must be no superstitious adherence to rule-of-thumb methods, which did fairly well at home; but, on the contrary, an open mind, quick to observe and ready to adopt new ideas. Labour-saving devices, for instance, which were little more than toys in the old home, may become vital elements of success in the new one. A clear understanding of the points of similarity and difference between the natural conditions of the old and the new surroundings is highly

important, for in the recognition of these differences often lies the key to success and progress.

Precautions to be Observed.—One piece of advice is given by all who have studied the practical working of immigration in new countries. It is that the newcomer should never invest any money he may possess until he has had some experience of his new home, and seen how those who came before him manage their affairs. Thus a young farmer should work for wages for a year in the neighbourhood in which he proposes to settle before taking up land on his own account; and a miner should, for a few months at least, acquire experience by working under old hands before he pegs out a claim for himself.

While the first opening up of new lands is work for young men without domestic ties, the development of a country on the best lines demands home life as its basis. At a time when athletic pursuits are common to both sexes, it may safely be said that young women, even of the highly-educated classes, are as well fitted as their brothers for a simple and arduous life. The instinctive domestic economy of an educated woman will do very much to round off the rough edges of life, even in the primitive outposts of the prairie or the bush, and, in a sister or a wife, will give permanence to efforts which might otherwise be without result. Another important consideration is that, if the benefits of civilisation are to be preserved, even though simplified in expression, the pioneer must be on the watch to avoid relapsing to the condition of the savage. The loneliness of life on the verge of a settlement has dangers in this respect; and the moral risks run in centres such as mining camps, where the only female society to be found is in the dancing and gaming saloons, have more to do with the failure of well-meaning young fellows than any amount of hard work or rough living.

Miss Flora Shaw, the well-known authority on colonial matters strongly recommends the emigration of educated girls to join their brothers after the advisable period of probation has been passed and a permanent settlement secured; but, of course, in such cases they must go out to work, and to work hard, not to lead "ornamental lives."

CHAPTER II.

THE DEVELOPMENT OF NEW LANDS.*

Development of Land — Classification of Resources — Utilisation of Resources—Maintenance of Resources—Attractive Power of Gold—The Idea of a Self-Sufficing Country—Foreign Trade and its Dangers —Possible Advantages of State Control of Trade—Geographical Conditions and the Past Development of Old Countries—Origin of Towns and Villages—Origin of Roads and Railways—Contrast between Old and New Countries—Geographical Boundaries—Government of New Lands—Topographical Surveys—Geological Surveys—Hydrographical Surveys—Climatological and other Surveys—Irrigation—Planning a System of Communications—Town Sites and Town Plans —People for New Lands—The Problem of Native Races—The Problem of Newcomers—Patriotism and the Land—Theory and Practice.

Development of Land.—The question of the development of land may be treated from many different points of view and in the light of different interests. In this chapter we take the matter up from the theoretical side and from the geographical point of view, which concerns itself rather with the land itself and its inhabitants than with the people who employ money in working its resources in the hope of making a profit without themselves living on the land. The word "development" has been so frequently used in the sense of expending capital on a country with a view to immediate profit, that it is necessary to define the larger sense in which it is used here. The reader, bearing in mind that this book is intended less for speculators than for investors, and more for settlers than for visitors in a new land, will recognise the value of taking geography in its full modern scientific sense as a guide for determining in what the development of a country consists. Such "development" as is produced by the endeavour to make the largest possible sum of money in the shortest practicable time, may possibly be the only kind applicable to very remote regions, which could never be made available for permanent human habitation; but for such

* Parts of this chapter have appeared in an article by the author entitled "The Development of Habitable Lands: a Study in Anthropogeography," published in *The Scottish Geographical Magazine*, for March, 1900.

lands only. Looking on the world as not only the home of man, but as subservient in all its phenomena to the welfare of the human race, we may consider the development of any region to mean such treatment of its natural resources as will enable the land to continue to support an increasing number of inhabitants. In the case of a new land—that is, of a region the resources of which are yet unutilised, and which is practically without inhabitants—the problem of development is presented in its easiest form. It becomes very difficult, however, when the density of population approaches the limit at which the means of subsistence threaten to become insufficient; then it becomes the serious problem of the restoration of old lands. The only case to be considered here is the development of the new lands of the temperate zones; but the possibility of a land growing old and exhausted must always be borne in view. Immediate advantage would be purchased too dearly if it involved exhaustion instead of development—killing, instead of feeding, the goose which should lay the golden eggs of the future. The question of developing lands becomes complicated in detail, because it involves large economic considerations and difficult distinctions between investment and speculation; but the broad principles are clear enough. It would appear that fortune-hunting is inimical to development in its true sense. A fortune acquired through production or speculation can usually be made by only a few individuals, and almost always entails the exhaustion of natural resources or the lowering of wages; a prosperous livelihood, on the other hand, can often be secured to a multitude without permanent impoverishment of the land.

The development of a habitable region, which implies the expenditure of labour or capital with a definite end in view, is essentially a process of securing the permanent adjustment of people to the land on which they live—a geographical problem which lies, it is true, at the root of politics, but which is not treated here from its political side.

Classification of Resources.—The natural resources of a region may be broadly divided into two classes, those which occur naturally in the crust of the Earth and are therefore limited in quantity, and those which utilise sources of energy external to the Earth and are therefore capable of being increased in quantity by appropriate means. The former class includes all minerals, precious metals, metallic ores, coal, precious stones, &c. These form a sort of reserve fund, the amount of which cannot be increased, and which even if very large should not be treated as if it were inexhaustible. The latter class includes all

vegetable and animal products. They can be improved by cultivation and breeding, as well as increased, in favourable conditions, to almost any desired extent. The latter class includes also such natural sources of energy as the heat and light of the sun, the power of wind and of running water. These resources may be looked upon as income, which cannot be drawn upon in advance, but is always punctually paid, and may in some cases be laid by for the future. As a transitional form between the two classes one may consider such resources as can only be produced slowly but may be readily destroyed. Of these, forests are the best example; if once destroyed, they cannot be renewed before the lapse of several generations, and sometimes not at all.

Utilisation of Resources.—Generally speaking, the requirements of a civilised people which ought to be furnished by their own land are (1) material for food and clothing, derived from the reproducible resources of the vegetable and animal worlds, and depending upon soil or climate; (2) material for houses, implements, machinery, and means of transport; these come, for work on a small scale, from the forests, but, for work on a large scale, only from the substance of the Earth's crust, and their distribution has nothing to do with the present distribution of climate; (3) the power of doing work. This third requirement is of very far-reaching importance, for it has to do with every form of agriculture, of mining, of manufacture, and of transport. Too little energy can be supplied by human or by animal power to be of much service in doing work on a large scale. It is true that primitive tribes may do a good deal in the way of hunting and fishing, in cultivating ground and building dwellings, in making canoes and travelling thousands of miles in them on inland waters, all by the strength of their own arm, or the aid of their domestic animals. But neither distant voyages on the ocean nor rapid travel on land is possible without making use of the larger powers of nature. These may be drawn from the accumulated treasure of mineral fuel, which, once exhausted, is unlikely to be replenished, or from the wind, running and falling water, and solar radiation, to which, for practical purposes, may be added the tides and the internal heat of the Earth. The second class of sources of energy may be drawn on freely without risk of exhaustion; and when, in a few centuries, coal and petroleum can no longer be obtained, the work of the world must be carried on by the powers which were in use before mineral fuel was discovered, but applied by methods unknown in ancient times. It is conceivable that economical

processes of storing and transmitting light, heat, and motive power electrically may be invented, which will supersede the use of coal even while it is still available in large quantities. The coal problem, which thirty years ago seemed to be the key to the whole history of civilisation, has now ceased to be a source of supreme anxiety. As yet, indeed, the coalfields continue to rule the industrial world, and in all industrial countries they are the seats of the densest population. But within the last few years we have seen great industrial centres being formed not only round the giant falls of Niagara, but near the torrents of all hilly and rainy countries. If the movement of population from the coalfields may be said to have not yet begun, at least the industrial monopoly held by coalfields for a century is being threatened by a rival destined to success. It is clear that at different stages of culture or of practical inventiveness different natural resources attain the chief importance, and different regions come temporarily to the front as the most favoured by nature, in these special respects, for the life of the time. The new tendency as regards the sources of power is an eminently healthy one, being towards the utilisation of the inexhaustible supplies due directly or indirectly to daily solar radiation.

Maintenance of Resources.—If a self-sufficing region is to continue self-supporting an effort should be made to regulate the use of mineral resources so as to postpone their exhaustion, while not reducing the output to such a degree as to hamper the development of the agricultural resources or of industry. The soil, on the other hand, should be treated so as to maintain or increase its fertility, by the ultimate return of all the mineral salts extracted by the crops, and the restoration also of the combined nitrogen removed in the same way. The necessity for this is not at once apparent in virgin soils, but many years of continuous cropping can not elapse without a significant reduction of fertility calling for remedial measures. An ideal state of things results in those places where grain is grown not for export but for feeding live stock, which, living on the land, return to it most of the valuable salts as manure; and where the animals are exported as preserved meat or meat extract, the bones and waste products of the slaughter-houses being worked up into fertilisers which restore the balance. In the scientific sense it is only the adoption of advanced agricultural methods which can be said to develop the land at all, but in the long run if all the forests are sacrificed to make room for fields, too much agriculture may help to ruin a country. Forest and field should

exist together, and, in the proper places, efforts as strenuous must be made to protect extensive woodlands from fire or reckless cutting, or to replant waste land with trees, as are usually bestowed in wooded countries on making clearings for farms.

Attractive Power of Gold.—Finds of gold or of diamonds have often been of service in drawing population to countries not otherwise attractive, but which, when developed by agriculture, have yielded far more from the fields than from the mines; California and Victoria are cases in point. There is no development possible in working out a small supply of precious metal by the introduction of an army of men, fed for a year or two on imported provisions, and withdrawn as soon as a better-paying field is discovered, perhaps at the other end of the world. For the true development of a country, mines of iron and coal, leading to the establishment of industrial works on a small scale at first, and growing gradually with the local demand, are far more valuable than a rush of thousands of diggers to a new goldfield. Naturally, an exception to the conservative treatment of mines may be made in the case of mineral resources occurring in countries incapable of being permanently inhabited, such as the polar regions. There can be no objection to robbing a land fit for no better fate.

Gold exercises an influence on the imagination which can only be characterised as magical, for it is not reasonable. The physical toil of getting alluvial gold is perhaps heavier than any other, the prices of the necessities of life are higher on goldfields than anywhere else, and more money seems to be wasted on drink or lost in gambling in the intervals of mining than under any other conditions. The fact that gold is the common standard of value probably accounts for the illusion that goldfields are better worth travelling to and working on than coalfields or brickfields. If the reader takes the trouble to divide the annual output of the goldfields of the world as officially declared, by the official number of miners engaged upon these fields, he will find that the output per man often does not exceed £1 per week, and very rarely exceeds £2. (See, for example, the notes on the output of gold in Australia and South Africa, *postea*.) Wages on these goldfields usually run from £3 to £5 a week at the cheapest, and there is the cost of machinery and interest on capital, looming large behind. There is certainly something wrong, perhaps with the statistics, but perhaps in the idea that gold-getting is usually profitable. That

some gold mines pay high dividends, then, only makes it more mysterious how the others continue to exist. It has been suggested that, taken over all, gold-mining never pays, that more than £1 has to be expended in order to extract gold enough to make a sovereign, and that this fact explains why gold maintains its value nearly unaltered in spite of the enormous increase in its production.

The Idea of a Self-sufficing Country.—In speaking of the development of a self-sufficing country, we introduce a condition which can be satisfied only by a country which covers half a continent like the United States, or a whole one like Australia. But when the high state of efficiency of means of transport, especially by sea, is taken into account, even the British Empire, scattered over all the world, may be considered as a single country, which might certainly be self-sufficing. The possible extension of the principle of federation or economic union even raises the thought—visionary enough as yet—that the only self-sufficing “country” to be ultimately dealt with is the whole land-surface of the planet. Most of the countries of the world are only endowed by Nature with a portion of the commodities which civilised life demands as necessities or refinement requires as luxuries; hence for most countries trade is as imperative as production, and the question as to the symmetrical development of the existing resources is beset with additional difficulties. One may inquire whether it is necessary to work any of the resources of a country except the most profitable, buying the other commodities where they can be had cheapest.

Foreign Trade and its Dangers.—For many years the agriculture of the United Kingdom has been allowed to decline, while food has been bought from other countries with the money paid for the products of British mines and factories. This is a natural consequence of the specialisation of modern life, but there is an underlying condition which often seems to have been lost sight of; from which, indeed, it is more comfortable to avert the mind. That condition is the continuance of peace. As long as amicable relations last there is no reason why each district or country, however small or large, should not produce only the products which suit it best, and trust to trade to supply all the rest; but when dissensions set in, the manufacturing and mining country, which does not produce food for its people, may be starved into subservience by a jealous rival. The myth that lapse of time and growth in civilisation make war impossible prevailed at the millennium of Christianity in 1000

A.D.; it was accepted as a demonstrated truth at the first International Exhibition in 1851, and the Peace Conference of 1899 may have been taken seriously by some people at the time. Events have shown in every case that war is an eventuality which can never be disregarded; and that the usages of international law are not to be depended on in the life and death struggles of nations.

Apart from such human and theoretically preventible difficulties, there are natural accidents to beware of. Transport may be interrupted by storm, the staple crop may be destroyed by disease, and then the district dependent on one resource must suffer acutely, while that in which several resources have been developed proportionately may escape with only some temporary hardship. The old sugar-growing countries furnish a good example of the first case; Ceylon, of the second. These considerations show that the development of every separately organised portion of habitable land—be it country, colony or island—should be made as complete and all-round as possible, while maintaining the natural advantages given it by the predominance of any one resource. The staple should be the chief, but never the exclusive, production.

Possible Advantages of State Control of Trade.—The strictly scientific point of view looks to the final result of any course of action, but the commercial point of view must take account of temporary conditions, such as fluctuations in prices, which may ruin one country and raise another to prosperity, without affecting the general balance of the world. The individual is of necessity at the mercy of financial considerations. When the price of copper falls he must shut up his copper mines; when the price of wheat goes down too low he must grow something else. When, after a time, the prices revive the miners have gone elsewhere, the works are filled with water, and their restoration is so costly that they may be permanently abandoned; but the wheat crops can be brought back to the field in a year's time. In such conditions it is a question whether the individual should not be supported by the community until the stress in his particular department is over. The Government of a country is bound to take steps to minimise the effects of natural accidents so as to avoid evil results to the country, and no finer instance of such a responsibility being assumed could be found than the treatment of famines by the Government of India. Great commercial disasters, too, have been recognised as occasions justifying public support; the principle is perhaps important enough to

be more definitely accepted as a preventive, as well as a palliative, measure.

If the ultimate question is to be how to find room for the inhabitants of the Earth, it would seem right that the main resource of a new land should not be allowed to be worked in such a way as to make impossible the subsequent development of minor resources essential to its habitability. For instance, if enormous masses of a sulphide ore of copper, or even of gold, underlie a wooded and cultivable country, would it not be wrong to work that ore to such an extent, and in such a manner, as to destroy the woods, sterilise the soil, and leave the place a desert when the ore is exhausted? On the other hand, it would be foolish to prohibit mining in an agricultural country in order not to reduce the ground available for crops; for where corn-land may bear a population of ten per square mile, and supply a large export trade, the mines might enable a population ten or twenty times as dense to find a comfortable living, and form a market on the spot for all the agricultural produce. So far as we can see the age of parochial exclusiveness is past, and that of cosmopolitan equality has not arrived, and the standard by which the development of a region has to be judged at the present day is that of a national policy. Nothing should be permitted in the way of utilising resources which, in enriching the individual, impoverishes or endangers the interests of the whole community—that is, of the country.

Geographical Conditions and the Past Development of Old Countries.—The study of the gradual growth of any of the old countries of Europe shows that geographical conditions, often unrecognised, directed the relation of the people to the land. It is possible to make too much of these conditions, which are only in rare cases sufficiently powerful to override all other considerations, and actually to dictate the order of development; but it is more common to make too little of them. The most powerful of all geographical conditions, the fundamentally geographical condition, is the relief of the land. This brings to the surface or buries beyond reach, mineral wealth, acts directly upon climate, conspires therewith to influence the nature and distribution of native plants and animals, and all together form an environment which moulds the destinies and directs the growth of human communities.

To take a familiar instance: the people of the mountains differ essentially in their manner of life from the people of the plains. Small communities grow up in separate mountain valleys practically under the same natural conditions, but shut

off one from another, and left to develop independently. The hunters and crofters of each group of valleys naturally form themselves into separate clans, at enmity or allied with each other, as the case may be, and very similar in organisation all over the world, whether in the Highlands of Scotland, the Caucasus, or the Himalaya. All are at one in viewing the property of the plain-dwellers as lawful spoil, and raiding as a natural calling. Later, such clans naturally tend to confederate while retaining complete local autonomy, as in Switzerland, unless compelled by external forces to assume other forms. On the plains small communities could not keep wholly apart, unless separated by forests or marshes, and thus the agriculturists of a fertile plain tend to coalesce into larger political units, and to give rise to countries of great size, reaching from the sea to the mountains, or to some great river. They have few natural strongholds to help them to become a law to themselves, and so in mutual self-defence they come to live at peace with each other, and exchange the valour of the warrior for productive industry and trade.

The influence of land-forms is indirect as well as direct, acting even more powerfully through the control of climate than through the mere physical bar to intercommunication. The wet seaward slopes of a country in the temperate zone naturally become better adapted for green crops than for grain, which in turn flourishes on the more sheltered land of moderate rainfall. Again, the dry climate of the heart of a continent, or in the lee of a great mountain range, is, as a rule, only available for grazing, and favourable to a nomadic life. Thus the native peoples who have grown up in different stages of culture on the great plains of North America, the puszta of Hungary, the steppes of Russia, or the semi-deserts of Mongolia, are curiously alike in their manner of living and in the elements of their social organisation.

Origin of Towns and Villages.—It is chiefly in their influence on the sites of settlements, and the lines of communications, that geographical conditions have shaped the old countries of the world, acting continuously and gently on countless generations of different races, and, in spite of the apparently revolutionary changes due to conquests by alien peoples, these causes have, as a rule, continued to bind the old villages and the old highroads to their ancient sites and tracks. The town grew up round the rock which gave a defensive position to the stronghold of the protecting baron; or it clustered on the level shelf of a raised beach or river-terrace round a deep and sheltered inlet of the sea; or at the highest point up-stream which the

ships of the period could reach; or it grew beside the ford where prudent travellers, arriving at nightfall, wished to stay when the river ran high before risking a crossing; or at the mouth of a valley which led up to a high pass; or in the middle of a gap across a narrow range; or perhaps on a strip of water-bearing rocks, where wells could be readily sunk for domestic supply; or the site might be fixed by the occurrence of valuable minerals, or perhaps by the presence of water-power. This natural law of selection, as applied to sites for settlements, accounts for the fact that even in England to-day, though the average density of population exceeds 500 per square mile, there are large tracts where one may travel on foot for hours without seeing a house, and where villages are nearly a day's journey apart. And there are places where the villages are strung together on some narrow belt of a particular geological formation—such as the Upper Greensand in the Weald—like beads on a necklace, or where the whole surface of some outcrop—say of the Coal-measures—is covered with town joined to town, as with a carpet.

Origin of Roads and Railways.—Roads arose either from the widening of footpaths skirting the fields from village to village, or they were constructed to join distant points of particular importance, running straight across the open plain, or clinging to the bare ridges of the Downs so as to avoid the woods and marshes of the low ground, or winding through the gorges of a river-valley to cross a stretch of broken country, or climbing by laborious zig-zags up the side of some wall-like range. The trunk-roads of a country usually follow the great structural lines of the land, either the valley-floors or the water-sheds. Upon the trunk-roads settlements spring up where travellers find it convenient to halt, or the people of adjoining hamlets to meet for trade. The chief street of such towns is formed of the road itself, the High Street, and so the roads built to connect great cities are themselves the cause of the growth of smaller towns. When railways began to take the place of roads their tracks were less dependent on local conditions. The hill which the road had to turn or cross was tunnelled by the railway; but in old countries the railways have to serve towns which the roads had created, so the main lines of the two systems are rarely dissimilar, though the track of the rails is more direct and the gradients easier. The sterner features of regional relief control railways like any other means of communication. In rough country the rails jostle the old road and the older river through narrow valleys, or wind along the sinuosities of the

coast-line, or skirt rugged hill-slopes in search of an easy crossing.

Contrast between Old and New Countries.—In an old country everything has grown gradually, each new thing has been grafted upon that which it was about to supersede. In domestic lighting, for instance, the candle gave place to the oil-lamp, and oil to gas, and gas is yielding to electric light, each new advance being hampered and often rendered nearly useless by restrictions arising from the old. The amount of capital locked up in the results of the past prevents the free adoption of the advances of the present. Vested interests form one of the strongest barriers to the development of an old country. It is evident that new countries can and must be developed on different lines from those which led to the slow advance of the old. The trail of the first few pioneers must be followed by the railway, and the road may often be omitted. The candle is followed directly by a complete installation of the electric light; the first rough wagon to jolt along the half-made streets of a new town is followed by an electric railway. The latest machinery is introduced at once in agriculture and in every budding industry, so that a single year may see a larger population established and a firmer hold taken of the land than a century would have seen under the conditions of a thousand years ago. One is tempted to believe that these great advances in invention and application have overleaped, and may ignore, the barriers which controlled the old wayfarers and handworkers. This is not the case however. The primary control exercised by land-forms, and the secondary control by climate, are there just as they always were, although their action is to be measured by the standard of cost rather than by that of possibility. A town can be founded and a railway can be built anywhere, if sufficient money is available for the purpose; but the town will not be prosperous, and the railway will not pay, unless the site of the one and the route of the other have been chosen with reference to geographical conditions. When the British Isles were colonised, a knowledge of the principles of geography was unimportant, for events moved so slowly that the slight differences of the resistances opposed to progress afforded sufficient guidance; and when a mistake was made, the result affected only a small district and a few people, and was easily retrieved. Now, things are done so rapidly and on so large a scale that a mistake involves very serious consequences, and may affect a vast number of people. The failure to dig a canal in Saxon England was never very far-reaching in its

effects ; but the failure of the Panama Canal Company was one of the great calamities of the world. Such mistakes can be avoided by studying the natural conditions which will come into play, and, as a rule, engineers recognise this, and form their plans accordingly.

Geographical Boundaries.—The blunders made by statesmen in attempting to draw international boundary lines so as to be capable of demarcation and to secure a fair division of natural advantages, have been frequently held up by the geographers of all nations as terrible examples of the workings of geographical ignorance. A definite, practical, and easily demarcated boundary is absolutely essential to the tranquil development of a country with neighbours. Such a muddle as that respecting the boundary of Alaska, and futile suggestions like those which were made for the boundaries of British Guiana, before the final settlement, could never have been made if the statesmen who were responsible had consulted geographers, and had acted on their advice. But within a securely marked boundary the necessity of following a scientific method of development is equally urgent. The boundary lines of the subdivision of a country (*e.g.*, into provinces and counties) should, as a rule, be meridians and parallels, or at least lines staked out to represent these—for it would be monstrous to have to shift boundary lines by a few yards if a more accurate determination of longitude showed that they were not quite in the intended position. In certain cases where there are natural boundaries, such as a lake shore, a wide river, or a definite mountain range, the larger boundaries might advantageously follow these.

Government of New Lands.—While the blunders of governments have been often held up to the light, it is pleasant to be able to refer to many acts of far-sighted policy, such as the magnificent survey of India, the charting of the coasts of the world by the British navy, the censuses of the United States, and the geological surveys of almost all British colonies and American states. Still, these measures are not always as well supported as they are planned. We may suppose a great new country just appropriated by a civilised Power, and about to be opened for exploitation, and try to indicate the manner in which geographical principles and past experience seem to require that such a country should be developed. There should be at the outset a central government of educated men with no personal pecuniary interest to serve. If it is decided to develop the land by means of great commercial companies, such companies should be strictly confined to their own work. Data for

computing the risk of putting a company in possession of great political and territorial power, and the expense of buying them back, may be found in the history of India, Canada, and tropical Africa.

Topographical Surveys.—It is the duty of a government to know its country. Surveys are of the very first importance, and it would be a good investment to make them thorough. Such work in developing a country might with justice be made a charge on posterity by the creation of a national debt. A trigonometrical network should be laid down first, with the smallest number of triangles of the greatest size possible, to cover the country and fix the exact position of important points on the coast and in the interior. The large triangles form a

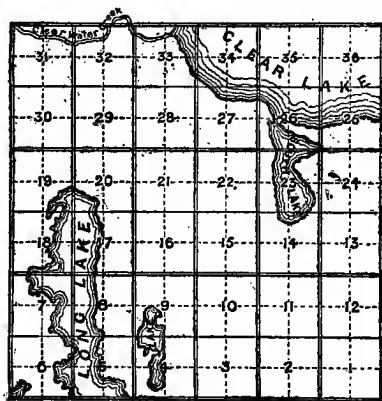


Fig. 1.—Canadian Township plan.

(From "*The International Geography*.")

framework on which to base secondary triangulations and fill in the detailed survey. The detailed survey should be topographical, and should aim at providing a map of the country on the scale of at least 1 : 50,000, or, say, the familiar and slightly smaller scale of one inch to the mile. Lines of levels should be run so as to enable the important features of vertical relief to be shown accurately by contours. The work, with modern photographic methods, can progress very rapidly in a country where there are only natural features to map, and no roads, buildings, or bewildering parish or county boundaries to be

hunted for and laid down. The expense would necessarily be heavy, but not so heavy for a large survey as for a small war, and a timely survey may be the means of averting or greatly shortening a campaign. If the Survey of British South Africa had been begun years ago, or even as late as 1880, and pushed forward with an ample supply of trained surveyors, the war of 1899-1900 within its borders would have been simpler, safer, and immensely cheaper.

The survey when completed should be made the basis of all land transfers, as in Australia; the large scale necessary for cadastral maps in old countries is not required when the parcels of land are large and divided by straight lines at right angles, as in the American township plans. (See Fig. 1). When small plots have to be transferred, a special survey of a small square on the land map could be made, and registered without more expense than the routine legal formalities demand in old countries.

Geological Surveys.—As each sheet of the topographical map is completed, the area it represents should be surveyed for its geological features, and the geological map produced with the least possible delay. In subdividing land into provinces designed ultimately to become units of local administration it may be well, if the relief of the land does not demand a different course, to draw the boundary lines at right angles to the prevailing line of strike of the strata, or to the coast line, so that each province will share the full variety of the natural resources. This was done by natural selection in many places in the old world. For instance, the communes surrounding some of the Hungarian lakes are divided by boundaries radiating from the water's edge, each commune having an equal share of the coast line, and widening as it ran inland. So also in part of the Weald district, the parishes are long and narrow, crossing the strike of the strata at right angles, and securing to each a strip of sheep pasture on the Chalk Downs, a strip of dry but water-bearing rock suited for a village site on the Upper Greensand, a strip of stiff arable land on the Gault, and a strip of rough cattle pasture on the Lower Greensand, where the river runs with its water carriage and water power. Such an arrangement adopted in a new country, when the geological features favour it, would help to secure a uniform distribution of population, with every kind of occupation represented in each unit, and to prevent the high specialisation and one-sided interests of a population exclusively mining, exclusively agricultural, or exclusively industrial. In order to lay out

boundaries with reference to these features, it is necessary that at least a preliminary geological survey should be made, before settlement on a large scale is encouraged, so that the population which is introduced may be of the kind likely to benefit most by the resources and to develop the country in the most advantageous way. The practical value of a geological survey with regard to mineral resources is understood and acted upon in all countries; but it is rare to find such surveys carried out with the good equipment they deserve. The first discovery of valuable minerals has probably been made more often by accident than in the course of a geological survey; and this is natural, as pioneers precede all surveys. But once the existence of a mineral deposit has been proved, the value of a geological survey becomes manifest. The extent and arrangement of rocks similar to those in which the valuable deposit has been found are definitely ascertained, and prospectors are thereby supplied with a serviceable guide, which shows them what regions to avoid, as well as in what parts their search is likely to be successful. The discovery of alluvial gold is perhaps less likely to be made, in the first instance, by geologists than that of coalfields, oil-fields, or deposits of metallic ores; but when gold mining enters upon its more advanced stage, the quartz reefs may often be mapped out by geological surveyors, to the great benefit of the public. No less important is the light thrown by a knowledge of the geological structure of a country on the position of water-bearing rocks, and the best positions for sinking artesian wells in arid districts.

Hydrographic Surveys.—A hydrographic survey of the coasts is also of great importance. All dangers to navigation should be sought for and discovered without waiting for the shipwrecks which have charted the coasts of the old world. The natural harbours should be sought out, and their relation to the land lines of communication studied, so that expensive artificial harbours may not be built in ignorance of the existence of better havens. The best sites for lighthouses also should be fixed and marked with beacons, to be superseded by proper lights when the increase of trade demands it. The hydrographic survey should not stop at the coast. The streams and lakes also deserve to be surveyed, and accurate data obtained not only of the navigability of every river, but of the volume of its water at different seasons, the slope of its bed, the rapids or waterfalls with the available horse-power of their energy. The government of Finland has made such a survey and issued a map which is of high importance in a country without

coal. The exact relation of the level of the river bed to the surrounding country becomes vitally important in the deltaic lands near the mouth, where floods are often to be feared, and have to be guarded against by extensive works, and also in arid or semi-arid regions where the possibility of irrigation may be the touchstone of prosperity.

Climatological and other Surveys.—A climatological survey is another important desideratum which has hitherto been much neglected even in well-peopled lands. It is not enough to equip a number of stations with instruments for observing temperature, rainfall, pressure, wind, and sunshine. The stations must be frequently inspected, and the observers kept up to, at least, the minimum standard of efficiency, while the stations must be placed in carefully selected positions so as to take account of the different local climates of a country. Good observations have to be collected for at least ten years, and often much longer, before any values which can be trusted to show the average climatic conditions can be secured; and once these are obtained, the necessity for maintaining the meteorological service is not diminished, but increased. It becomes more easy every year for the central office to forecast the approach of changes of weather; and, once the habitual storm-tracks of a country have been discovered, the establishment of a few additional stations in the places thus suggested may be the means of greatly improving forecasts, and adding to the security and prosperity not only of fishermen and seafarers, but of farmers and miners. How important an extensive system of rain measurement is in some new countries appears strikingly in the common Australian calculation of converting inches of rain into number of sheep or even pounds of wool per acre. The part which the configuration of the land or its degree of cultivation plays in influencing local climate has never yet been fully discussed for any country, although such attempts as have been made, on a small scale, in that direction, show that the subject is a promising one to pursue.

Further, a biological survey may be undertaken. The distribution of forests, and the nature of the trees composing them, ought to be accurately ascertained. Much of the prosperity of a country depends on the maintenance of a proper proportion of the surface under wood; and an enlightened system of forestry will tend not only to keep the supply of timber continuous, but to maintain the regular flow of rivers, and thereby the fertility of the cleared land. In selecting lands for clearing in countries covered with natural forest care should be taken to distinguish

between the areas which will yield good agricultural land, and those which are fit for forest trees and nothing else. The kinds and habits of fish and land fauna should be studied by the government of a new land in time to prevent the extinction of useful species, and the introduction of species that prove hurtful.

It is not necessary that the various surveys mentioned above should each have a separate and costly organisation. One field party, selected so as to contain a few specialists and several general assistants, could attend to all departments of the land surveys. The main thing to secure is official recognition and adequate provision for such work, which is indeed often permitted as a sort of concession to the non-professional hobbies of surveyors.

Irrigation.—Of all the methods by which governments assist in developing new countries, the most important is perhaps the promotion of irrigation works. It is believed, although the evidence on the subject is perhaps not yet conclusive, that a gradual process of desiccation is going on in all the continents, diminution of rainfall and increase of evaporation leading to the extension of deserts and the sterilising of steppes. The fact at least is certain that in every continent there is a vast area of arid or sub-arid land, the rainfall on which is insufficient for any form of agriculture, or even for good pasture. The great plains which stretch along the east of the Rocky Mountains from the borders of the sub-arctic forest to the Gulf of Mexico, the pampas of Patagonia, the high veldt in South Africa, the whole interior of temperate Asia, and almost the whole continent of Australia require only a water supply to become permanently productive lands. The works required for irrigation on a large scale are too costly, and involve the treatment of too great an area of country to be undertaken profitably by individuals or even associations. They necessitate geographical changes of the first order: the construction of reservoirs as large as lakes, the diversion of rivers where they flow full and perennial from the mountains, so that instead of reaching the deep-sunk beds which literally *drain* the country, they are made to run at the level of the general surface, above the valleys towards which the water must be trained to flow through irrigation-channels which vivify the land. Already governments have begun to bestir themselves in this direction, and the irrigation surveys of the United States are a fine example of what can be done. But every land surface has its own intimate character, the treatment of which must be, if one may so put it, personal to itself, and

methods successful in one place may not prove to be equally applicable to another. This is, indeed, true of all efforts to develop land; imitation of work accomplished elsewhere is not enough, every region must be studied in itself before the appropriate treatment can be prescribed. In the much rarer cases of land with an imperceptible slope and heavy rainfall, drainage may become as important a problem as irrigation is in dry regions, and the dyking and draining of marshy ground subject to floods becomes an obligation on the government.

Planning a System of Communications.—Next to the stock-taking of national resources, the development of a country demands the provision of a serviceable system of communications. To plan such a system requires the solution of a difficult problem in practical geography, involving the foresight of probable town sites and centres of population. The main lines of communication are usually supplied by the river systems, either as channels of navigation or lines for roads and railways. In a temperate country it is natural to find convergent lines of communication closing in at the head of sea-navigation on a great river. Such lines, whether for water or land carriage, require to be completed artificially across the watersheds linking the various river basins landward, and a final line to join together the towns which will arise along the coast would complete an ideal outline. As time goes on the great arterial lines of communication would be inter-connected at numerous points according to the exigencies of trade; but while the initiative and support of a government are necessary for the great trunk lines of the framework, the subsequent completion may safely be left to private enterprise. River valleys are not the only natural lines of communication. In some types of country the watersheds offer superior advantages for roads, as, for instance, in New South Wales; or some peculiar geological formation, like the great line of eskers parallel to the south coast of Finland, may compel both road and railway to occupy a ready-made track.

The advisability of considering general principles in planning a system of communications for a given region is sometimes forcibly demonstrated by the absurd schemes which are put forward for railways to reach any place which comes temporarily into prominence. It is shown also by the frequent construction of two railway lines in a district which could quite well be served by one.

All navigable inland waters should be brought into connection with the general system of communications of a country as early

as possible, for a light-draught steamer plying on a river becomes a good pioneer of a railway line. The placing of stations along a new line of railway should be regulated by regard to the natural converging points for roads, even if roads do not yet exist; attention has also to be paid, of course, to the proximity of supplies of water or fuel. The device of running the main trunk roads in a system of rectangles is contrary to nature, and apt to result in unhappy gradients even in easy country. The main roads should run in harmony with the natural lines of the country-side, a mile or so of increased distance being balanced by easy gradients; but there is no reason why a rectangular system of bye-roads to connect adjacent settlements should not be associated with naturally aligned high-roads.

Every type of land-surface requires its special system of road location. As a general rule, the less engineering that is necessary, the more commodiously will the road perform its function of opening up a country. But, of course, exceptional cases demand exceptional treatment. On a dry level plain the roads may run straight from point to point; over a rugged mountain region, which is only a barrier, it is often a question of relative cost alone whether a line will cross through a tunnel or wind over a pass.

Town Sites and Town Plans.—In a new country the sites of towns are usually determined by the positions of the most convenient harbours, the junctions of lines of communications, and the neighbourhood of extensive mineral resources. In the course of natural development the village or the town comes before the province, which is rarely a natural growth. But in many new lands the provincial boundaries are first drawn, and a centre of administration has to be placed somewhere within the area. It is by no means necessary to have this centre in the middle of the province; in fact, nothing is more striking on the political map of any continent than the non-central position of the capital of almost every country. Madrid is the only conspicuous exception.

The practice of planning out towns in rapidly growing countries on one common chessboard pattern has many points in its favour. It is simple, allows of easy registration of building lots, and a stranger can always find his way about. The plan, however, is only adapted for level or slightly undulating sites. A town ought to be planned and built for a site as carefully as a suit of clothes is cut and made for a man. A rectangular plan for a site on a triangular tongue of land at the junction of two rivers, or in an amphitheatre of hills rising from a bay, or in a narrow mountain valley, is a

misfit, and can never be either comfortable or convenient. It stands to reason that on a broken site one set of streets should run nearly in the curves of the contour-lines, keeping almost to one level, with just slope enough for ready drainage, while the connecting streets descend the slopes not at right angles, but obliquely to reduce the gradients. Planned thus, a town acquires distinctive character from its site, and avoids the shame of rectangular intersecting streets, each horizontally straight, but undulated like a switchback railway, or perhaps with its row of houses broken here by a bridge over a gorge, there by a face of rock in a deep cutting. In selecting the site for a new town the questions of drainage, water-supply, and security from risks of flood or landslips have all to be taken into account. From the neglect of one or other of these precautions new towns have time after time been failures. The familiar unhealthiness of new goldfields is usually due to the complete neglect to provide any system of either drainage or water-supply, and these are only acute instances of a chronic defect in the growing towns even of the most progressive colonies. The question of sewage disposal is quite as urgent a problem in a new community as in an old one; and there is the less excuse for neglect where one can start from the beginning with experience bought by more deaths than have followed all the battles of all ages.

People for New Lands.—The last and most important element in the development of new lands is the introduction of the right sort of people to inhabit them. The chief difference between a new land and an old is the more primitive character of the former, and thus one might be tempted to suppose that the best type of inhabitants would be those who care least for the comforts of life, and are least dependent on elaborate methods of working. But in a new country, where labour is scarce and dear, every labour-saving contrivance must be used, and the best machinery is worth obtaining, so that adaptability to new conditions and intelligence to make the utmost use of the latest advances count for much. The farmer who at home still looks upon steam machinery as “new-fangled” may find himself confronted in Australia by sheep-shearing machinery run by electric power. At the present day, it would be hard to find in any developing colony the four-armed windmill against which Don Quixote fought; but modern wind-motors on their lofty steel shafts are common. New lands must be developed by modern methods, and the best type of man who can be found is not too good for the work. The desirable

qualifications are to be strong, practical, educated, and open-minded.

From the point of view of government, the new lands of the temperate world are almost equally divided between, on the one hand, the autocracy of Russia, as exercised in Siberia (which contains more than half of the new lands comfortably habitable by Europeans); and, on the other, the republican governments of the United States and South America, and the no less liberal forms of self-government followed in the British colonies of Canada, Australia, and South Africa. The new lands of the second category have become refuges for people subject to political or religious disabilities at home, and so are gathering in, amongst a prevailing Anglo-Saxon population, a mixture representing almost every European race. There can be no doubt that new racial types are now developing in the environments of the new countries by the grafting of branches of every variety of the white type of mankind into the prevailing Anglo-Saxon stock. It is a healthy sign that in almost all new countries efforts are made to prevent the intrusion of undesirable immigrants, while those who are suitable are welcomed, regardless of race or creed.

While the future of the new lands now undergoing development is more in the hands of the people who are carrying on the work than was ever the case before, the necessity of state guidance and help at the outset was never greater. The whole community recognises the necessity of a complete system of communications, of holding and administering the vacant lands as the property of the State until required for allotment, of keeping order in thinly settled districts and amongst the shifting crowds of mining camps, of assisting and encouraging agriculture, and generally aiding in the development of the country by an expenditure of capital which could in no other way be obtained without the establishment of monopolies that would hamper the free enterprise of individual settlers.

The Problem of Native Races.—Many complications arise in the development of a country which require to be faced and dealt with. No land can be looked upon as absolutely "new"; some one has been there before, and some artificial disabilities have to be contended with in addition to those arising from nature. Amongst these the most serious arises from the presence of aboriginal inhabitants of a low grade of culture. Such primitive peoples are dangerous in many ways. They may resent the settlement of their hunting-grounds, and make reprisals on settlers for the loss of their game, as in Australia;

they may cause the deterioration of the superior race by inter-marriage, as in South America; or, without going to either extreme, they may lead to constant irritation and slow degradation among the settlers on the outposts. It is rarely that native races make good workers. Sometimes, by careful management, small communities are trained to work in civilised methods, and show great aptitude for special callings; for instance, the Indian pilots who steer the steamers through the rapids of the St. Lawrence. Frequently the contact of white and dark races results in the rapid extinction of the latter; but there are cases where the compulsory preservation of peace between native tribes leads to a rapid increase of the coloured population, as in Natal.

The problem of the treatment of subject races is very difficult. The spread of a knowledge of reading and writing, or the adoption of Christianity, does not necessarily fit the native for self-government; and however widely the political suffrages of a country where white and coloured races live together may be drawn, means are usually found to prevent the exercise of any real political power on the part of the latter. It is a question worth discussing whether a frank recognition by the administration of a state of matters which exists might not be a sounder policy than that of proclaiming equality before the law, and allowing the proclamation to be nullified by the force of custom. There is no doubt that by wise treatment from the beginning, native races might preserve their self-respect, and be brought to occupy a useful position in the growing life of a new country. But it is unfortunately rare to find a native race unhurt by premature contact with the scum of white society, which floats over all the world in advance of the wave of worthy settlers; and the mischief once done is hard to repair. Again and again, since the first successes of the Jesuits in South America, Christian missions have succeeded in bringing isolated native tribes into a state of industry and happiness, without loss of health or vitality; but if there are any cases of primitive peoples brought into a state of civilisation high enough to enable them to resist deterioration by contact with degraded whites, they must be very few.

The civilisation of the white race is the result of long development in conditions which have been gradually changing; and it is now being generally recognised as unreasonable to expect to bring races, inferior at the start, to a high plane of culture in a few generations. The development of new lands must be viewed from the point of view of the European conquest of the world;

and it is mere affectation to pretend that native races, handicapped by an inheritance of intellectual and moral inferiority, can be placed at once or soon upon an equal platform with the white. That exceptions exist it is a pleasure to recognise, but the rule prevails. If it is necessary to impress on people at home the folly of treating prematurely and superficially civilised tribes as equals, it is unfortunately even more necessary to warn white settlers in distant lands of the wickedness of treating the aborigines as people without rights. The brutality of white settlers with regard to natives is a scandal usually denied in print, but often frankly acknowledged in conversation. It should be the business of every government to secure the right of all natives to undisturbed possession of a sufficiency of good land, and to see that the punishment of natives for crimes which they do not understand should be more lenient rather than heavier than the punishment of similarly offending whites. It is not difficult to secure the passing of excellent laws on this subject, the difficulty lies in their application.

The Problem of Newcomers.—A problem of another kind arises in many cases from the conflicting interests of new immigrants in a country and the descendants of earlier settlers, perhaps of a different European race, who have grown into harmony with their new surroundings, but cling to old ideas which the newcomers have outgrown. In time, with a good deal of mutual forbearance, the dissensions due to racial antipathy die away, for the newcomers in their turn take the colour of the country and adopt the resultant mode of life. The accentuation of racial troubles may perhaps be usually referred to periods during which the rate of immigration is too rapid, and the newcomers have not had time to acquire that adaptation to their new conditions which would bring them into friendly touch with the earlier occupants. These, too, require time to recognise that they must allow new methods of development of the land which they have been accustomed to ignore or despise. Such dissensions, painful and disastrous as they sometimes may be, are mere episodes in the process of the adjustment of the human organism to its environment, which is always going on, and which is always tending to a condition of ultimate equilibrium. The rebellion on the Red River, in Canada, in 1870, may be traced to this cause, and it has led to the result indicated by general principles. The applicability of a similar line of argument to the position in South Africa, which led to the war of 1899-1900, is obvious.

Patriotism and the Land.—Settlers in a new land become, at any rate in the second generation, creatures of that land; and although they may maintain the most cordial and loyal relations with the country of their origin, they are bound primarily to their adopted soil. No land can be fairly developed by people who merely wish to snatch a fortune or a competence from it, and go elsewhere to spend it. It is impossible to transport a nation to a new land; the result of anthropogeographical study is to show that in a new land a new nation is developed, the power and influence of which in the world's history does not depend upon maintaining old nationality, though it depends largely on retaining old sympathies. Who can say that New France has lost in any degree in becoming Canadian; or that New England is less influential since it became American? The grip of the land on its inhabitant is a thing of nature, the source and safeguard of patriotic feeling. Just as the loyalty of a Scotsman is fervent to his narrower fatherland, yet unquestioned to the kingdom and the empire; so through the devotion of the people to their land, which grows with time, and not quickly, a real yet a diverse patriotism is arising in every associated unity of the British Empire, held together in virtue of the common sympathy, until, perhaps, in some future time, it enters as a majestic unit into a vast English-speaking union, and in a more distant age merges, we may dream, into the wider "Federation of the World."

Theory and Practice.—This chapter has been in the main theoretical. Its purpose, like that of all theoretical writing, is to make the reader think. It may be that the author is wrong in some of the conclusions which he has ventured to draw from the consideration of special facts in the light of general theories; but to the practical man such ideas cannot but prove of value if he uses them wisely. Certain suggestions are thrown out which the author believes to be true, but it is quite certain they are not the whole truth, and their application in detail and in actual cases must be left to those who are engaged in the real work. The following chapters contain no theory, but merely records of fact, but these facts will be found to support the theory sufficiently to induce a thoughtful pioneer to consider the plan of his work in the light of geographical principles. In that way alone can the utmost value be obtained for the time, labour, and money spent by a settler, although that full value will not, perhaps, be realised in the lifetime of the pioneer.

CHAPTER III.

THE DOMINION OF CANADA.

General Position and Boundaries—Surface—Climate—Government—Laws—Currency—Time—Composition of Population—Resources of the Dominion—Fur Trade—Fisheries—Forests—Mineral Wealth—Agriculture—Existing Agricultural Resources—Government Encouragement to Agriculture—Public Lands—Dominion Lands—Railways—Ocean Steamers.

Position and Boundaries.—The Dominion of Canada occupies the northern half of the continent of North America, with the exception of a strip of the coast of Labrador, which is administered by the colony of Newfoundland, and a strip of the coast and peninsula of Alaska in the north-west, which are part of the United States. It ranges in latitude from the Arctic Archipelago beyond 80° N., to the Ontario peninsula, which crosses the parallel of 42° N. In longitude it reaches from 57° W. on the Atlantic, to 141° on the Pacific. The land boundary with the United States is in many ways an awkward line, not yet quite settled in parts, and formerly a source of international friction. From the Pacific coast to the Lake of the Woods, the frontier is the parallel of 49° N., a perfectly definite line which has been marked out with posts on the ground; but since the main mountain features of North America run north and south, the boundary is not marked by any natural feature, and would be difficult, if not impossible, to fortify. From the Lake of the Woods eastward it follows the centre of Rainy River, the centre of Lakes Superior, Huron, Erie, and Ontario, and the St. Lawrence river to near Montreal, and then strikes eastward overland with a definitely fixed but irregular course.

The western boundary with the territory of Alaska is still (1900) the subject of diplomatic negotiations, but the trouble which this uncertainty caused has been diminished by a provisional agreement as to the most critical part, which leaves the harbours for the goldfields of Yukon district in the United States, and draws the line at the summit of the passes in the coastal range.

The northern portion is perfectly definite, being the meridian of 141° W., from the Arctic Sea to a point ten marine leagues from the coast of the Pacific. At the most important places—*e.g.*, where it cuts the Yukon river—this line has been fixed and staked out. Alaskan territory runs as a narrow strip along the coast to 56° N., and it is the breadth of this strip which is in dispute. The boundary is defined as following the summit of the mountains parallel to the coast, but whenever the summit of these mountains is situated more than ten marine leagues from the ocean, the limit shall be “a line parallel to the winding of the coast, and which shall never exceed a distance of ten marine leagues therefrom.” The chief difficulty in interpreting this clause is the uncertainty whether the “winding of the coast” includes or excludes the long narrow fjords which run inland from the sea.

The total area of the Dominion is greater than that of Europe, but, on account of the extreme climate of the Arctic portion, and the absence of natural resources in other parts, the comparison with Europe is fallacious, so far as the capability of the country to support population is concerned.

AREA AND POPULATION OF THE DOMINION OF CANADA.

	Area in Square Miles.	Population in 1891.	
		Number.	Density.
Nova Scotia,	20,600	450,396	22
Prince Edward Island,	2,133	109,078	54
New Brunswick,	28,200	321,263	11
Quebec,	347,350	1,488,538	4
Ontario,	222,000	2,114,321	10
Manitoba,	73,956	152,506	2·4
British Columbia,	383,300	98,173	0·3
Assiniboia,	89,535	66,799	...
Saskatchewan,	107,092		
Alberta,	106,100		
Keewatin,	478,800		
Athabasca,	251,300	32,168	...
Mackenzie, }	998,214		
Yukon, }			
Ungava, }			
Franklin,	300,000	...	...
Great Lakes of St. Lawrence,	47,400		
Total,	3,455,980	4,833,239	1·4

The area of the smaller lakes and rivers is included in the above estimates.

It may be stated generally, as regards the provinces, that Prince Edward Island is fully occupied, that Franklin, which consists of the Arctic Islands, is valueless, while Ungava, Yukon, Mackenzie, and Keewatin are likely to prove of value only where gold or other valuable minerals may be found; but that the greater part of Quebec, Ontario, Manitoba, British Columbia, Assiniboia, Saskatchewan, Alberta, and Athabasca are capable of, and still awaiting, development. This must be done by the introduction of population, and of capital, for the working of the forests, fisheries, minerals, and especially the agricultural and pastoral lands. The resources and the conditions of life of each province will be described later.

Surface.—Vast as Canada is, the physical geography is remarkably simple. The St. Lawrence River, and its associated great lakes, sweep round the eastern half of the southern part of the country bordered closely on the north by a water-shed, for the most part in the form of a gentle elevation called The Height of Land. Along the west coast runs a broad strip of rugged highland, about 400 miles wide in the south and narrowing northward, the eastern margin of which is formed by the Rocky Mountains, and the western by the Coast Range. This mountainous region drains mainly to the Pacific, and is intersected by numerous valleys and plateaux, while fjords penetrate it from the sea and islands fringe the shore. East of the Rocky Mountains the land slopes from an elevation of about 5000 feet in great plains or prairies to the Arctic Sea and Hudson Bay. The Mackenzie River flows northward, but the rest of the drainage of the country flows into Hudson Bay from every side. So far as an ordinary map shows, Hudson Bay is the heart of Canada, the natural focus of its trade, and of the means of penetration to the interior, for it carries the deep water of the ocean to the very centre of the continent. Unfortunately, the severe winter climate completely closes the sea for many months, and during the time when it is open for navigation the narrow entrance is always liable to become obstructed by drifting ice, so that it has remained practically unused.

The geology of Canada stands in close relation to the surface features of the country. Hudson Bay is the centre of a vast V-shaped region of Archæan rocks, which extends southward to the St. Lawrence and westward to the Mackenzie. This Archæan nucleus is surrounded by a belt of Palæozoic rocks,

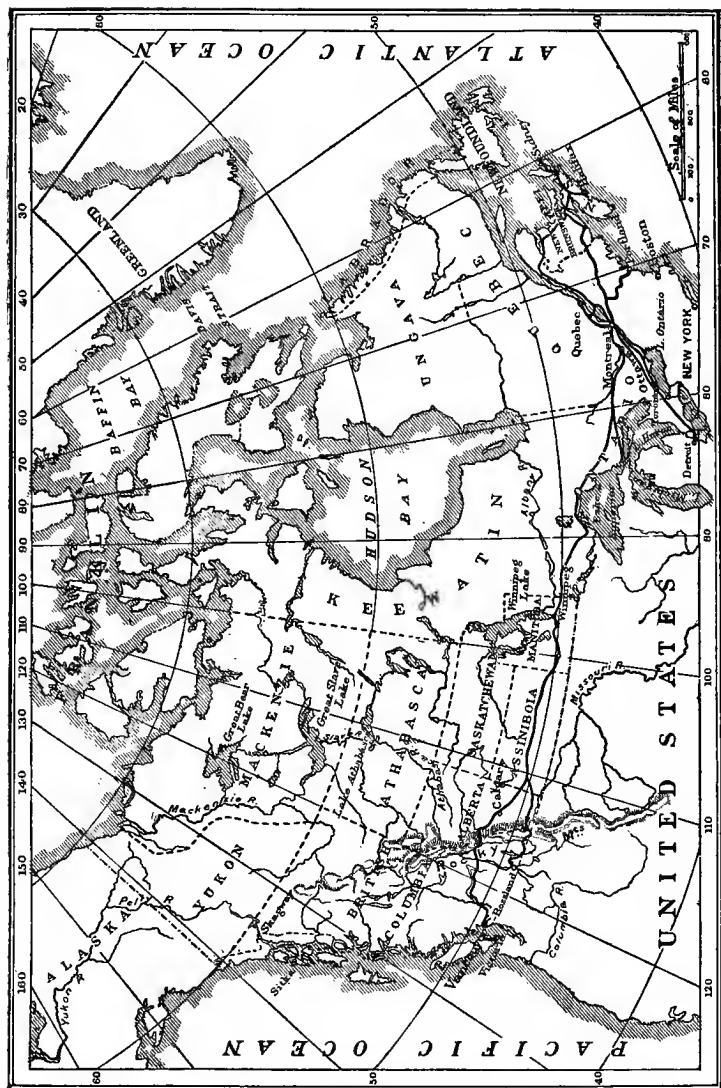


Fig. 2.—Map of Dominion of Canada.

separated from the Palæozoic and Mesozoic masses of the mountainous western strip by the broad plains and prairies, which are underlain by more recent formations. All the low grounds of Canada, from the Atlantic to the Rocky Mountains, have been greatly altered by the ice sheet of the great ice age, the underlying formations being in many cases completely covered by boulder clay, the accumulations of which have given to the river systems a peculiar indecisiveness. Thus the smaller lakes have frequently outlets by two rivers, tributary to different systems, and other rivers which do not meet at a common source approach so nearly that their navigable waters are only separated by a short stretch of nearly level ground. It is this feature which has made the canoe so universal a means of travelling in the vast regions of the remote north-west during summer.

Climate.—On the west coast of Canada, particularly in Vancouver Island, the climate closely corresponds to that of the British Isles. The prevailing sea winds ensure cloudy skies and a high rainfall, with cool summers and mild winters. But from the crest of the Coast Range, a few miles distant from the Pacific shores, to the Atlantic, across the whole breadth of the continent, the climate is severely continental, intensely hot in summer and intensely cold in winter, while the rainfall, although subject to local variations, is relatively low. The distribution of the rainfall throughout the year, however, in some cases renders nearly three-quarters of the annual supply available in the spring months, when it is of service in agriculture.

Except for a narrow strip on the Pacific coast the mean temperature of the air in every part of Canada is below the freezing point during December, January, and February, and except in British Columbia, during November and March also. Winter may thus be said to last for five months throughout the country, while the average temperature of the month of January is below zero Fahrenheit as far south as 50° N. latitude in the centre of the country. Such extreme temperatures, however, do not appear to have a bad effect; a farmer in the North-Western Territories will drive across the frozen prairie for a week, sleeping each night in the open air with the mercury in the thermometer frozen (– 40° F.), and be none the worse for it. Precautions have, of course, to be taken against frost bite; but Canadians are unanimous in saying that in that exhilarating atmosphere a temperature far below zero is enjoyable, and that nothing so trying as a raw wet winter's day in England is ever experienced.

In summer there is a wonderful contrast, the difference being most marked in the north-west. Thus the average temperature of the two months, July and August, is 60° in the valleys of the Mackenzie and the Yukon, almost up to the Arctic circle, and the average for the south of the Dominion is over 70° ; the extreme temperatures in the low plains are, indeed, often overpowering. The influence of these climatic conditions on farming will be noted when we describe the various provinces.

The percentage of bright sunshine is greater for all parts of Canada than for northern Europe, clear sky and exhilarating air at all seasons being characteristic of the climate.

Government.—The Dominion of Canada is a federation of self-governing provinces, with a Federal Government possessing certain rights over the whole territory. The executive authority is vested in the British Crown, and is exercised by a Governor-General appointed by the British Government, and a Privy Council. The legislative power of the Federal Government is vested in two Houses of Parliament, a Senate or Upper House of 81 members, appointed for life by the Governor-General, and a House of Commons of 213 members, elected by the people, the qualifications of electors being different in the various provinces. The Parliament meets in Ottawa, where the Governor-General resides. The Government, as in the United Kingdom, is composed of the leading members of the political party which has a majority in the House of Commons. Except for the right of appeal from its decisions to the Privy Council in London, the Dominion of Canada is free from any political or judicial control on the part of the Mother Country.

The functions of the Dominion Parliament include, amongst others, the regulation of Trade and Commerce, the working of the Post Office (but not of the Telegraphs, which are in the hands of private companies), Defence, Navigation, Quarantine, Currency and Coinage, Indirect Taxation, Criminal Procedure, Marriage Laws,* and all legislation as to Weights and Measures, Bankruptcy, Indian affairs, &c. Thus throughout Canada there is uniformity of fundamental laws, the administration of which is the concern of the central government, in contrast to the United States, in which the several States exercise larger rights and differ greatly from one another in many important particulars.

* Marriage with a deceased wife's sister, or a deceased wife's sister's daughter, is legal in the Dominion of Canada, as, indeed, in almost all British colonies.

Each province has its own Legislature elected by the people, and consisting in some cases of two chambers, in others of one. They have the control of direct taxation, of education, public works, and the liquor laws, and the provinces which were formerly colonies have the disposal of the unoccupied lands as well. Each province has also its own system of municipal government, the units being usually counties, townships, villages, and cities.

With regard to the spirit of the Canadian people, two points never fail to strike the visitor to the country—the respect for law, ensuring the security of life and property, even in the mining camps, and the hearty loyalty of the whole population to the British Crown. The position of Canada as a central link in the British Empire, intermediate between the United Kingdom on the east of the Atlantic, and Hong-Kong and Australia on the west of the Pacific, is well understood and highly prized in the Dominion.

Laws.—There are comparatively few restrictive laws in operation, and such as exist are for the most part framed with the object of ensuring the prosperity of the working man, who, in almost all the provinces and territories has a lien on the product of his work for the payment of his wages. The right is maintained of excluding undesirable immigrants, and Chinese on landing are subject to a tax of £10; but one of the chief needs of the country being population every encouragement is offered to respectable European settlers. Great care is taken to prevent the introduction of epidemic or contagious diseases, and the quarantine service is well organised. No one is allowed to land who cannot produce evidence of having been vaccinated or of having had smallpox.

More than half the public revenue of the Dominion of Canada is derived from duties levied on imports, the average rate in 1897 having been 30 per cent. *ad valorem*. About four-tenths of the imports are, however, admitted free, and the duties are differential in favour of free-trade countries, which is practically an encouragement to trade with the United Kingdom in preference to foreign countries.

Currency.—The system of currency is identical with that of the United States, the unit being the dollar, and the ratio being fixed by statute at £1 = \$4·86. The hundredth of a dollar, or cent, is thus equal to one halfpenny; but it may be noted that the silver five cent piece is the smallest coin usually current. In 1897 articles appeared in the newspapers of Victoria, B.C., expressing disgust at the action of the Post

Office in introducing the custom of giving change less than five cents. Evening papers nominally priced at two cents are vended by the newsboys with the cry of "three for five"—*i.e.*, three different papers for a five cent piece. The Dominion Government issues notes for 25 cents, one, two, and four dollars; the banks, which are numerous, have the right only of issuing notes of \$5, or over.

There is no mint in Canada, and nearly all the gold mined in the country is sent to the United States to be assayed and coined. In this respect Canada is behind the Australian colonies.

Weights and measures are the same as in England, except that the hundredweight is reckoned at 100 lbs., and the ton ("short ton") at 2000 lbs., as in the United States.

Time.—The regulation of time has also been assimilated to that in the United States. The principle adopted is to have a series of standard times, each differing by an exact hour, and based on the meridian of Greenwich. There are six north-and-south belts of 15° of longitude, within which one time holds good; but for practical convenience some slight modifications are made. The designations of the local times with the hour at Greenwich noon, the meridian to which the time corresponds, the boundary meridians at which the hour changes, and the stations on the Canadian Pacific Railway at which the change is made are as follows:—

THE TIME ZONES OF NORTH AMERICA.

Designation.	Atlantic.	Eastern.	Central.	Mountain.	Pacific.
Central Meridian, . .	60°	75°	90°	105°	120°
Greenwich Noon, . .	8 a.m.	7 a.m.	6 a.m.	5 a.m.	4 a.m.
C.P.R. Stations where Standards Change, .	...	<div style="text-align: center;"> ⏟ Fort-William. Brandon. Donald. </div>			

It will be noticed that the time remains unchanged in actual usage from Quebec to Port-Arthur, a range of 28° of longitude, and in this belt by far the greater part of the population of the Dominion is located.

Composition of Population.—Although a British possession, the Dominion of Canada is by no means homogeneous in respect to the origin of its population. In 1891, 86 per cent.

of the population were native-born, and the origin of the remaining 14 per cent. was as follows:—

Origin, . . .	British Empire.	United States.	Germany.
Number, . . .	490,200	80,900	27,700
Origin, . . .	Russia.	Scandinavia.	France.
Number, . . .	9,200	7,800	5,400
Origin, . . .	Southern Europe.	China.	Other Countries.
Number, . . .	3,000	9,100	13,900

There are about 100,000 aborigines belonging to different tribes of "Red Indians." Several thousand Austro-Hungarian subjects, chiefly from Galicia and Bukovina, have immigrated since 1891; and the number of Russians has also been notably increased; but the tendency is for all the foreign elements, except the French, to become absorbed in the general population, and to adopt English as their sole language in the second, or, at most, in the third generation. The reason of the non-assimilation of the French is historical. Eastern Canada was originally a French colony, and, on its conquest by the British, in 1759, the French Roman Catholic population were guaranteed in the possession of their language, laws, and religion. They numbered at that time only about 60,000, but, being perhaps the most prolific civilised people in the world, they now amount to nearly a million and a-half. Thus it happens that the census of 1891 recorded 1,405,000 French speakers and 3,428,000 English speakers in the Dominion.

The geographical grouping of the people is important. The French live mainly in the province of Quebec, which is more French than English; while the recent immigrants from continental Europe are scattered in groups amongst a predominantly British population in Manitoba and the North-West Territories. The "Indians" live, for the most part, beyond the settled areas; and the Chinese are practically found in large numbers only in British Columbia. The half-breeds between French and Indians carry on a great part of the trade by dog-sledge and canoe in the northern part of the country. There is, of course, perfect religious freedom, and no established church exists; the Roman Catholic Church includes two millions of the population, and the Methodists, Presbyterians, and Anglicans number about three-quarters of a million each. Such peculiarities of the prevailing population as may be of importance to the settler or trader will be described when speaking of the several provinces. It is to be noted that the population is far more uniformly distributed over the land than

is the case in Australia or temperate South America. The tendency to concentrate in a few large cities has never manifested itself to the same degree in Canada as, for example, in Victoria, New South Wales, or the Argentine Republic.

Resources of the Dominion.—Originally the fur trade was the staple industry of Canada; subsequently, lumbering took the first place in the interior, and fisheries on the coast; at the present time the agricultural resources are the chief source of wealth in the country, while in the near future mining bids fair to outdistance all rivals. Ultimately, if the land is wisely developed, and the population is steadily augmented, the proportionate development of all the varied resources foreshadows a brilliant future to Canada as a highly-civilised country, dependant on the outer world for nothing but tropical products. The ratio of value of the various exports from Canada in 1897 may be stated roughly as follows:—

Products of . . .	Farming.	Forests.	Mines.	Fisheries.	Total.
Percentage value, .	51	30	10	9	100

Thus it appears that, from the point of view of external trade the farming interest (especially cattle-breeding and dairy farming) in Canada outweighs all others taken together, and the Government policy for developing the country is shaped mainly in accordance with this circumstance.

Before considering the opportunities for further development in the different provinces, and the encouragement held out by the governments, federal and provincial, it is necessary to look at the general condition of the whole Dominion in the light of each of the great groups of industries.

Fur Trade.—The Hudson Bay Company, founded in 1670, was the first to develop the fur trade in the north and west of America, and is still the principal agency, although with changed times it has undergone development, and its stores, originally created to trade with Indians in the wilderness, have grown into the finest emporiums of retail trade that have ever been established in a new country. Furs are collected by the Indians throughout the whole of the North-West Territories and in British Columbia, and brought to the posts maintained by the company at intervals over the country. While the posts from Victoria and Vancouver along the railway line eastward to Montreal and Quebec are in daily communication, the outlying forts on the Mackenzie and on the rivers flowing into Hudson Bay are only visited once a year by boats bringing supplies and taking away skins. Two centres of collection are still

maintained on Hudson Bay—York Factory, at the mouth of the Nelson River, visited annually by a steamer from London; and Moose Factory, at the head of James Bay, also visited by a sailing vessel from London once a year. The company's annual fur sales realise, as a rule, from £200,000 to £300,000. The furs which are produced in greatest quantity are, in order of number—Beaver, marten, mink, and musquash; but include also large quantities of badger, bear, deer, fisher, fox, lynx, otter, rabbit, racoon, skunk, wolf, and wolverine.* The fur trade is not, however, one which is susceptible of any great future development.

Fisheries.—Although fishing vessels of every nationality ply their trade on the Grand Banks of Newfoundland, and much of the catch is landed on that island and in foreign ports, the share which falls to Canada, together with the coast fisheries on the east and west and the fresh-water fisheries, make up a vast and rapidly-increasing source of wealth. The total value is indeed estimated at \$30,000,000, or £6,000,000 annually, or two hundred times as much as in the year 1850. There are over 60,000 fishermen in the Dominion. Professor Prince† recognises seven great fishery divisions, which may be briefly summarised as follows:—

1. *The Atlantic*, from the Bay of Fundy to the coast of Labrador, including both deep-sea and inshore fishing of cod, mackerel, haddock, halibut, herring, and hake. To these the capture of seals and white whales, and the taking of lobsters and oysters, may be added to make up a total of \$10,000,000 (£2,000,000) a year.

2. *Estuarine and Inland Waters of the Maritime Provinces* yielding salmon, shad, gaspereaux (alewife), striped bass, &c., to a total value annually of \$2,500,000 (£500,000).

3. *The Great Lakes and Tributaries*.—Here the lake whitefish, lesser whitefish or lake herring, great lake trout, sturgeon, pickerel, black bass, and many other fresh-water fish are caught to the annual value of \$2,000,000 (£400,000).

4. *Great North-West Lakes* (including Manitoba) yielding similar fish to the value of \$1,000,000 (£200,000).

5. *Rocky Mountain Plateau*, fresh-water fisheries, including land-locked salmon, whitefish, &c., as yet little utilised, and the value of which is not recorded.

* From articles on the fur trade, by Sir Donald Smith (Lord Strathcona), in the *Handbook of Canada*. Toronto (British Association meeting), 1897.

† *Handbook to Canada*, Toronto, 1897.

6. *Pacific Coast Fisheries.*—These include salmon of several species which are caught at various places on the coast and in the estuaries, and tinned in enormous quantities; but there are also halibut, skill (black cod), oolachan (candle fish), anchovy, herring, and others, which as yet have hardly been touched. The annual value is about \$4,000,000 (£800,000), but this is capable of being enormously increased.

7. *Hudson Bay and Arctic Waters*, in which whale, walrus, and seal hunting are still to be carried on, and where fish of marketable value are also doubtless to be found.

The fisheries of Canada are regulated, and the statistics collected, by a highly efficient department of the Federal Government, and a fleet of armed cruisers ensures from the fishing boats respect for the regulations, and collects and distributes information as to the movements of the shoals of migratory fishes. Close seasons are established during spawning time, fishing licences are granted, specifying the nature of the nets to be employed, obstructions to the movement of fish and the pollution of rivers are prohibited, and the artificial propagation of fish is carried out at a number of stations.

On the east coast there is little room for additional competition, but in the great lakes, the inland waters, and all along the west coast, there are still great opportunities for developing the fisheries.

Forests.—The traveller along the Canadian Pacific Railway, from the Atlantic to the Pacific Oceans, looks in vain for a typical Canadian forest. Everywhere, where trees once grew, either the axe of the settler in clearing land for cultivation, or the unguarded fire of the prospector and railway engineer, has wrought destruction. If not checked, the fires that follow the pioneer will, before many decades, have destroyed one great resource of the Dominion of Canada. As yet, however, beyond the burnt railway belt, the forests stretch for vast distances, and cover an area estimated altogether at from 1,000,000 to 1,250,000 square miles. A continuous forest may be said to extend right across the continent from the interior of the Labrador peninsula and the Maritime Provinces to the Pacific coast, bounded on the north by the Tundra, along a line running from 60° N. on Hudson Bay to 67° on the Mackenzie River, and interrupted on the south by the belt of prairies or treeless plains which run from the international boundary on the Red River of the North to the Saskatchewan. Even the prairie belt is naturally wooded on its occasional hills and along the rivers. While coniferous trees chiefly prevail, there are great woods

of birch, aspen, elm, maple, and many others, the distribution of which will be described when speaking of the separate provinces.

In 1891 a capital of over \$100,000,000 (£20,000,000) was invested in industries directly dependent on the forests, and yielded an annual product of the value of \$125,000,000 (£25,000,000.) The slow-growing white or Weymouth pine is at present the most important tree in Canada from the economic point of view, and it grows abundantly in the eastern provinces; but, from the amount of cutting, its extinction as a commercial timber tree is already threatened. Next to it in value comes the spruce, the chief timber of the Maritime Provinces and of the region north of that in which the pine flourishes. In the subarctic forest and in the richly wooded Pacific slope of British Columbia there is a vast supply of timber but no market. The eastern rivers flowing to the St. Lawrence and to the sea are naturally the best adapted for floating timber down to tide water for export to Europe, and hence the lumbering trade has developed mainly round the St. Lawrence. Here there is little opening for newcomers, as all the operations of cutting and floating timber require trained workmen, and the various contingencies affecting the trade make experience absolutely essential in directing proceedings. However, in the west, on the margin of the prairies, or in the neighbourhood of new mining camps, lumbering and saw-milling may still prove remunerative, even to new hands.

Timber cutting in the Crown forests, which include most of those still available, is carried out under the supervision of the provincial governments, and under regulations which differ in different places. As yet sufficient regard is not paid to forestry, and, unless some very definite action is soon taken to ensure the reproduction of the woods, Canada must cease to be a great timber exporting country. The destruction of forests always brings other evils in its train, both as regards the climate and the soil, deterioration in either of which must inevitably affect agriculture.

Mineral Wealth.—The mineral resources of Canada are of vast extent, and as yet so little utilised as to form an almost new field for capital. Hitherto the development of the country has been carried on mainly from the agricultural point of view, and as Professor Coleman observes “the bulk of the population have grown up with no knowledge of mines, and with the thrifty virtues of farmers and merchants averse to risking their savings

in an untried and hazardous occupation."* More capital, particularly from Canadian and British sources, is, in fact, the great desideratum in order to make the vast mineral wealth of Canada an instrument in the economic development of the country.

Nothing strikes the visitor to the mining centres more forcibly than the fact that so many of the well-equipped and flourishing establishments are filled with American machinery, maintained by American capital, and directed by American mining and metallurgical experts. The mineral wealth of Canada is, indeed, to a very large extent, utilised in enriching citizens of the United States.

The main work of the Dominion Government towards utilising the mineral resources is carried on by the Geological Survey, a department admirably administered and very efficiently manned. Its duties are to construct a geological map of the whole Dominion of Canada, and this is being done on various scales, and with different degrees of detail. No topographical maps of the outlying regions being as yet in existence, the first task of the Geological Survey is to construct a topographical map, on which the geological data are afterwards laid down. In the far north, where the geological surveyors have in many cases been the first explorers, the scale adopted is usually from 8 to 25 miles to an inch, but in the regions actually undergoing development the work is much more exact, and the scale enlarged to 4 miles, or even 1 mile to the inch. These maps form invaluable guides to the prospector who knows how to use them, and the first work of any one investigating the mineral value of a region that has been surveyed is to study the published maps. They must be looked upon merely as guides, for the work has been in most cases rapidly done, and many details are necessarily disregarded. Handbooks to the maps, and elaborate reports, place the investigations of the surveyors at the service of all. The Survey also takes account of the statistics of mineral production throughout the Dominion.

The present state of mining, and the nature of the chief mineral products, are only partially shown in the following table, which includes the whole Dominion. The rapid progress of gold mining has been remarkable since 1898.

These are all the minerals the production of which exceeds a million dollars in annual value, but asbestos, iron ore, mica, phosphates, and several other minerals, besides building stones, are by no means unimportant; and every one of these products exists in an easily accessible form and in enormous quantities.

* *Handbook to Canada*, p. 306.

MINERAL PRODUCTS IN 1897.

Product.	Amount Raised in Tons.	Value in \$.	Value in £.
Coal,	3,876,000	7,442,000	1,488,400
Gold (in 1899, \$21,000,000),	6,190,000	1,236,000
Silver,	3,322,000	663,400
Copper,	1,500,000	300,000
Nickel,	1,400,000	280,000
Lead,	1,397,000	279,000
Petroleum,	1,011,000	202,000

Gold is found in every province, and will be referred to under each of those in which its presence in payable quantities is assured. The provinces producing most were formerly the same as for coal—Nova Scotia and British Columbia. Recently the Yukon Territory has sprung into rivalry with both, and great goldfields have been discovered in western Ontario. It is necessary to distinguish between (1) the placer deposits, in which the nuggets and particles of gold have simply to be picked up or washed from the gravel and sand; (2) the quartz mines, which must be quarried or mined out, the ore crushed, and the gold extracted by amalgamation or chemical processes; and (3) the ore in which gold is chemically combined with other elements, or so mixed as to require smelting and elaborate metallurgical operations in order to separate it. The amount of capital required for successful working thus differs greatly in different localities on account of the machinery required, as well as the convenience or difficulty of providing means of transport and of obtaining supplies.

Silver has been produced in Quebec, Ontario, and British Columbia; and at present it is obtained almost exclusively from silver-lead ores in the Kootenay district of British Columbia.

Copper ore is mined in Quebec, Ontario, and British Columbia. It has been usual to export the roughly smelted *matte* to the United States to be worked up, not so much for the copper as for the nickel with which it is associated at Sudbury, in Ontario, and the gold by which it is accompanied in the Kootenay district. But copper ore was formerly mined for its own sake at many points along the shores of the Great Lakes, and the supply is by no means exhausted.

The *Nickel* deposits at Sudbury are the most extensive in the world, and are largely worked, the ore being nickeliferous

pyrrhotite; but none of the metal is produced in Canada, the final metallurgical process being carried on in the United States.

The small quantity of *Iron* mined in the Dominion is surprising, and while over 1,000,000 tons of pig iron were produced in 1893, not one-half of that amount is now made, the low price of British and American iron, and the cheapness of transport, making it cheaper to import than to manufacture. Ores of platinum, zinc, chromium, and mercury exist in many places, but are scarcely utilised.

Coal is worked mainly in the extreme east and west—in Nova Scotia and Vancouver Island—but vast deposits, estimated to underlie an area of 65,000 square miles, exist in the North West Territories along the base of the Rocky Mountains.

Petroleum, often accompanied by natural gas, is most worked in the Ontario Peninsula; but a vast untouched field is believed to exist in the North West Territories, and smaller quantities occur at many different points.

While the Dominion Government exercises rights, grants mining claims, and exacts royalties on gold in the territories, several of the provinces have their own Department of Mines and their own mining laws. Such departments exist in Nova Scotia, Quebec, Ontario, and British Columbia.

Agriculture.—The present wealth of Canada arises mainly from its farm lands, and it is a matter of great importance to know how far these can be extended in the outlying districts. Soil, climate, and surface are the main factors to consider, and these have all been carefully studied. The question is so large that it must be treated with some degree of detail.

Existing Agricultural Resources.—At the census of 1891, the total area of improved land was 28,500,000 acres, of which nearly 20,000,000 acres were used for growing grain. Yet Canada has not become the great grain exporting country that these figures would seem to promise; as a matter of fact, the export of oats and barley, once of great importance, has almost ceased, and the export of wheat was once nearly twice as large as it is now. Of the 100,000,000 bushels of oats and the 20,000,000 bushels of barley grown annually in the Dominion, fully nine-tenths are used in the country as food for animals, and the same is true, though to a less extent, for wheat. Mr. William Saunders, Director of the Dominion Experimental Farms, says*:—"While Canadian farms are producing annually increasing quantities of grain, these, with the exception of wheat, are being mainly converted into animals and their products,

* *Handbook to Canada*, 1897, p. 341.

which constitute the principal items of export. The increase in the manufacture of dairy products has been very helpful to the cattle trade, and at the same time it has promoted a rapid development of the swine industry. . . . By exporting animals and their products, in place of coarse grains, the elements of fertility taken from the ground by these crops are largely returned in the manure of the animals, and thus the fertility of the land is kept up."

The agriculture of Canada takes account of fruit to a very considerable extent, especially apples. The distribution of the various products will be referred to when speaking of the provinces; but it may be stated generally that "mixed" and dairy farming prevail in Quebec and eastern Ontario, fruit growing in the Ontario peninsula, wheat growing in Manitoba, and cattle ranching in the territories occupying the great plains that slope up to the Rocky Mountains.

The actual value of the various classes of agricultural exports in 1897 was as follows :—

EXPORTS OF ANIMAL PRODUCTS IN 1897.

Cheese.	Cattle.	Horses.	Sheep.	Eggs.	Other Animal Products.
\$14,676,000	\$7,133,000	\$1,711,000	\$1,002,000	\$978,000	\$13,745,000
£2,935,000	£1,426,600	£342,200	£200,500	£195,600	£2,749,000

EXPORTS OF VEGETABLE PRODUCTS IN 1897.

Wheat and Wheat Flour.	Peas.	Apples.	Hay.	Other Agricultural Products.
\$7,085,000	\$2,353,000	\$2,682,000	\$999,000	\$4,863,000
£1,417,000	£470,600	£536,400	£199,800	£972,600

Government Encouragement to Agriculture.—Both the Dominion and the provincial governments devote much attention to the improvement of the land already in use, the settling of new land by farmers, and the introduction of new methods and crops. The departments of the Dominion Government concerned in these works are the Ministries of the Interior and of Agriculture.

Under the Minister of Agriculture a number of experimental farms and agricultural schools and colleges have been established. The function of the experimental farms cannot be better expressed than in the words of the Act which called them into existence :—

"To test the merits, hardiness, and adaptability of new or untried varieties of cereals and other field crops, of grasses,

forage plants, fruits, vegetables, plants, and trees, and to disseminate among persons engaged in farming, gardening, or fruit growing upon such conditions as may be prescribed by the Minister, samples of the surplus of such products as are considered to be specially worthy of introduction.

"To test the relative value for all purposes of different breeds of stock, and their adaptability to the varying climate or other conditions which prevail in the several provinces of the Dominion and in the North-West Territories.

"To examine into the economic conditions involved in the production of butter and cheese.

"To analyse fertilisers, whether natural or artificial, and to conduct experiments with such fertilisers, in order to test their comparative value as applied to crops of different kinds.

"To examine into the composition and digestibility of foods for domestic animals, to conduct experiments in the planting of trees for timber and shelter, to examine into the diseases to which cultivated plants and trees are subject; also, into the ravages of destructive insects, and to ascertain and test the most useful preventives and remedies to be used in each case.

"To investigate the diseases to which domestic animals are subject, to ascertain the vitality and purity of agricultural seeds, and to conduct any other experiments and researches bearing upon the agricultural industry of Canada which are approved by the Minister."

The Central Experimental Farm is situated at Ottawa, in a convenient place for experiments required in the populous provinces of Quebec and Ontario. Four others on a somewhat smaller scale are scattered over the Dominion, performing similar services for the other provinces. One of these is at Nappan, in Nova Scotia, near the New Brunswick boundary; a second is at Brandon, in the middle of the prairie province, Manitoba; a third at Indian Head, in Assiniboia, in the drier climate of the plains sloping to the Rocky Mountains; and the fourth at Agassiz, in British Columbia, takes account of the mild and moist climate of the Pacific coast belt. Besides the experimental work, the staffs of these farms form so many bureaux of agricultural information, answering without charge the inquiries addressed to them. Samples of grain or of seeds sent in by farmers are tested, and samples of new varieties of grain, the qualities of which are likely to suit particular localities, are sent out free of charge to any farmer willing to try them. Within seven years no less than 120,000 applicants availed themselves of this opportunity. Seedling trees are also

distributed in the same way. Applied botany and entomology are also part of the work done on the experimental farms; new fruits and trees have been introduced, and warnings as to noxious insects issued. The soils of new parts of the country are analysed at the experimental farms before settlement has taken place, and fertilising agents are also analysed and reported on.

A former source of considerable export trade, the ginseng plant, seems to have entirely dropped out of sight. This plant (*Panax quinquefolium*), though yielding a root inferior to the allied species in Korea, meets with an unfailing demand in China, and amongst Chinamen everywhere, and its cultivation should be profitable.

An elaborate quarantine system for live stock is designed to keep the Dominion of Canada free from contagious cattle disease, and to stamp out any disease that may appear within its boundaries. All imports of cattle or other live stock by sea must take place at Charlottetown, in Prince Edward Island; Dartmouth, opposite Halifax, in Nova Scotia; St. John, New Brunswick; Point Levis, opposite Quebec; or Victoria, on Vancouver Island; and three months' quarantine is imposed before the animals are allowed to be removed to the farms. Since 1897, inspection has been substituted for quarantine on cattle entering from the United States, the arrangement being reciprocal. "There is," according to Professor M'Eachran, the chief inspector of live stock for the Dominion, "no stock country in the world where the health of animals is so remarkable. Rinderpest, pleuro-pneumonia, and foot-and-mouth disease do not exist."

The agricultural schools and colleges give practical instruction in the methods of farming best suited to Canada, and any young man going to Canada with a view to settling as a farmer would do well to take out a course of instruction in one of them. The Canadian Government especially warns people against paying a premium to unknown farmers as pupils. The system has given rise to much abuse, and it is always better to take employment as a farm hand, receiving wages and acquiring practical insight at the same time.

Public Lands.—By the Act of Confederation the public lands—*i.e.*, lands not held by individuals or corporations—and minerals situated in the provinces of Ontario, Quebec, Nova Scotia, and New Brunswick were vested in the provincial governments, by which alone they can be assigned. In 1870 the territorial rights of the Hudson Bay Company in the north-

west were surrendered to the Dominion Government in return for a money payment, and the grant of land around the trading posts, and of one-twentieth of all the land in the "Fertile Belt"—i.e., the great area lying between the Lake of the Woods and Lake Winnipeg on the east, and the Rocky Mountains on the west, and stretching from the international boundary to the North Saskatchewan River. When British Columbia joined the Dominion, all the land within 20 miles of the Canadian Pacific Railway was made over to the central Government, and later on 3,000,000 acres in the Peace River district were similarly transferred. The regulations as to provincial Crown lands will be considered later, it is only necessary here to describe the arrangements made by the Dominion Government as to the public lands of Manitoba, the North-West Territory, and the assigned portions of British Columbia.

Dominion Lands.—The Dominion Land Survey is charged with surveying and laying out in townships the public lands available for agriculture or pasturage, before these are opened to settlement. In order to simplify the registration of land and the transfer of property, the townships are all formed on a common plan, each measuring 6 miles square, or 36 square miles in area. The townships are bounded north and south by parallels of latitude, and in order to adjust their square forms to the converging meridians of longitude, the lines running at right angles to these (nearly north to south) only extend through four rows of townships, and are re-adjusted for the four further north. The townships are numbered from south to north, starting from the international boundary, and the ranges or rows of townships from east to west, starting from the principal meridians. The first "principal meridian" is nearly coincident with longitude $97^{\circ} 30'$, lying a little west of Winnipeg, and is the only one from which ranges are measured east as well as west. To the west 34 ranges lead to the second principal meridian (102° W.), and west of that 30 ranges lead to the third principal meridian (106° W.), in the west of Assiniboia and Saskatchewan, and so on to the fifth.

Each township is subdivided into 36 "sections," each of which measures 1 square mile, and they are numbered consecutively in east and west rows alternately, backward and forward as shown in Fig. 1, p. 18. A uniform system is adopted for Manitoba and the territories lying west of it, so that any square mile of land in these districts may be exactly defined by the number of the section, the number of the township row, and of the range, the last being qualified by the words east or west of a particular

meridian. The sections are subdivided into quarter sections of 160 acres. These, when not already disposed of, are open to settlement, a homestead of 160 acres being given free of charge (except for a registration fee of \$10 or £2), on condition that the applicant builds a dwelling, lives on the land for at least six months of each year, and brings a certain proportion of it under cultivation. The patent of ownership is not given until the homestead has been occupied for three years, but a settler is allowed to obtain full possession of his homestead at an earlier date, by purchase, if he so desires. An adjoining quarter section of land may be subsequently purchased at a fixed rate from the Dominion Government. No. 8, three-quarters or the whole of No. 26 in each township, are, by agreement, the property of the Hudson Bay Company. The other even-numbered sections are available for homesteads. Most of the railways in the far west have extensive grants of land within a belt of 24 miles on each side of the line, having all the odd-numbered sections except Nos. 11 and 29, which are reserved as endowment for schools. The school lands are to remain vacant until the township is fairly well settled, then when they have attained a reasonable approximation to their maximum value they are to be sold, and the purchase money invested in Canadian Government stock, the proceeds being applied to the maintenance of public schools. The Hudson Bay and Railway lands are usually available for purchase at low rates, the situation of the Railway lands giving them considerable value.

Grazing leases are granted on Dominion lands at the rate of one penny per acre per annum, 100,000 acres being the largest amount let to one person. The lease is held subject to the immediate and continuous utilisation of the land, by placing upon it in each of the first three years one head of cattle to every 60 acres, bringing up the total to one head of cattle for every 20 acres.

Special rules are in force as to mineral lands, which will be described under the provinces.

The holders of homesteads or purchased farms on Dominion lands, which are without timber, are entitled, on obtaining a licence from the Crown Timber Agent (for which a nominal registration fee is charged), to cut as much timber as they require for constructive purposes or fuel, on unoccupied Crown land. When there is timbered land in the vicinity a settler may purchase a wood lot not exceeding 20 acres at a low rate. Licences to cut timber for sale on surveyed or unsurveyed Dominion lands are granted by the Crown Timber Agent, after open competition, to the highest bidder.

The work of the Dominion Land Survey had, up to the end of 1898, completed the survey of a little over 80,000,000 acres, or 500,000 farms of 160 acres each. This, although equal to 125,000 square miles, is a very small fraction of the vast areas of Crown lands available for cultivation between Lake Superior and the Rocky Mountains.

The disposal of the Dominion lands is carried out through a number of local agencies, as well as at the central office in Ottawa, and the Railway and Hudson Bay lands are also to be had through local agents. Information is freely given to inquirers; letters should be addressed to the Commissioners of Dominion Lands, Ottawa; or to the Agent for Dominion Lands at the following towns in the west:—Winnipeg, Minnedosa, Dauphin, Brandon, Alameda, Yorkton, Prince Albert, Regina, Lethbridge, Edmonton, Red Deer, Calgary, Kamloops, and New Westminster.

Railways and Waterways.—Canada possesses railways to the length of almost 17,000 miles, most of these being single lines. The most remarkable railway system is the Canadian Pacific (familiarily known as the C.P.R.), on which through trains run from Montreal to Vancouver, a distance of 2906 miles, in four days. The line has several branches, the most important being that through the Crow Nest Pass, from Lethbridge to the Kootenay gold-mining region. Other lines run out towards the north-west from several points of the Canadian Pacific west of Winnipeg; and there are junctions with United States lines in the east, the centre, and the west. The Grand Trunk Railway has an extensive system in eastern Canada, especially in the Ontario peninsula; and the Inter-Colonial Railway (which belongs to the Dominion Government) connects the Maritime Provinces with Montreal. There are many junctions with the railways of the United States in the eastern provinces, at Winnipeg, and in British Columbia. The development of the North-West Territories is being largely carried on by a system of railway extension, river and lake navigation also playing an important part.

Inland navigation takes place mainly on the St. Lawrence system. Access to the great lakes from the sea is given by the St. Lawrence and Niagara Rivers, the various rapids and waterfalls being avoided by 70 miles of canals. The locks on these are mostly 270 feet long by 45 wide, and have 14 feet of water on the sills; but a few short lengths have smaller locks, and admit vessels of only 9 feet draught. These are, however, being enlarged to a standard size. The rapids of the St. Marie

River, between Lake Superior and Lake Huron, are overcome by the Sault Ste. Marie Canal (usually known as the Soo Canal), under 1 mile in length, with its single lock 900 feet long and 60 feet wide. The rivers and lakes of British Columbia and of the North-West Territories are in many cases navigated by light draught steamers for great distances.

A railway from Winnipeg to a port on Hudson Bay has often been suggested, in order to bring the centre of the country within easy reach of ocean steamers; but the uncertainty of the navigation of Hudson Strait, on account of ice, has hitherto prevented its adoption.

Ocean Steamers.—The Allan, Dominion, and Beaver lines run large passenger steamers from Liverpool direct to Quebec and Montreal in the summer, and to Halifax or St. John in winter, when the St. Lawrence is frozen. They take about nine days for the passage; but a service of faster steamers has been spoken of, which should reduce the time to six days or less. The Canadian Steamship Company, in 1898, started steamers from Milford to Charlottetown, Prince Edward Island, and the port of Paspébiac, on Chaleur Bay, in the Gulf of St. Lawrence, which is never blocked by ice, although there is considerable risk in being caught in floating pack ice in the Gulf of St. Lawrence during the winter months. On the west side, the Canadian Pacific Company runs steamers fortnightly or monthly to Japan and to Australia.

CHAPTER IV.

THE DOMINION OF CANADA—EASTERN PROVINCES.

Nova Scotia—Farming—Mining—New Brunswick—Forests—Prince Edward's Island—Quebec—People—Climate—Natural Divisions—Communications—Resources—Lumbering—Minerals—Mining Laws—Ontario—Access and People—Natural Divisions—Climate—Communications—Laws—Resources—New Agricultural Land—Timber—Fisheries—Mining—Corundum—Iron—Copper and Nickel—Silver and Platinum—Gold—Mining Laws.

NOVA SCOTIA.

THE Province of Nova Scotia occupies the peninsula between the Atlantic Ocean and the Bay of Fundy. It lies further east and south than any other province in Canada, but the advantages of climate due to low latitude and proximity to the sea are largely counterbalanced by the frequent fogs due to the cold current which passes along the coast. The excessive cutting of the forests in the eastern coast belt has led to a deterioration of the climate of the interior, by allowing the raw sea winds to penetrate unchecked. Halifax, the capital, is one of the few Canadian seaports which is open all the year round, and the Inter-Colonial Railway carries a considerable volume of trade in winter to the inland provinces.

The fishing and lumbering industries, which are carried out on a large scale, occupy a considerable part of the population, but require local knowledge and experience in those seeking to pursue them.

Farming.—The best farming land is all occupied, and the Crown lands of the province, which are still undisposed of, do not offer much inducement to newcomers. The salt marsh land of the Annapolis Valley is one of the best parts of Canada for fruit growing, especially for apples, and also for general farming. This land is consequently comparatively dear, costing from £3 to £8 per acre when improved and in good order. The general conditions of life are easy, the farmhouses being particularly

well built and comfortable, with good markets for all farm products, while the variety of other industries which flourish in the province make it more like the old country than most parts of Canada. The majority of the inhabitants were born in the province, and, as a rule, are of Scottish descent.

Government help is offered in promoting creameries and cheese factories, and dairy farming is consequently being developed.

Mining.—The best opportunities for enterprise will probably be found in the mining industry. The coalfields of the province cover about 635 square miles, and produce nearly 2,500,000 tons of coal annually. Most of the mines are at Sydney, in Cape Breton Island, in Cumberland County, at Joggins and Springhill, on the Inter-Colonial Railway, in the extreme west of the province, and in Pictou County, near New Glasgow. The total quantity of available coal in the province is estimated at 7,000,000,000 tons.* A royalty of 10 cents (5d.) per ton is paid to the provincial government on all coal sold or removed from the mine, or used in the manufacture of coke.

Iron is also mined and manufactured to some extent, the ores being of very high quality. The Dominion Government pays a bounty of from \$2 to \$3 per ton on pig iron and steel manufactured in Canada from Canadian ore.

Gold is found in considerable quantities all along the south-east coast from Cape Breton to Yarmouth, the yield approaching 30,000 ounces per annum, worth, approximately, \$637,000 (£127,000.) The gold of Nova Scotia occurs in quartz veins in Cambrian quartzites or slates. The fissure veins are usually narrow but rich, while the great bulk of the quartz is of low grade, and is only now being seriously attacked. The convenient situation of the goldfields, the favourable climate, and the steady supply of labour, permit of the ore being worked economically, the cost of mining and milling combined not exceeding \$1.65 (6s. 8d.) per ton. The average richness in gold was, in 1893, \$8.68 (39s. 6d.) per ton, but formerly it averaged \$12 (50s.) The chief goldfields are at Stormont, on the coast, about 48 miles from Cape Canso; the other important centres being Brookfield, Caribou, Uniacke, Fifteen-mile Stream, and Sherbrooke. The industry could doubtless be greatly extended.

The search for minerals in Nova Scotia is subject to the control of the provincial government, which grants a licence to prospect for gold or silver at a rate of 50 cents (2s.) per area per annum, the minimum number of areas taken being six and the

* *Statistical Year Book of Canada*, for 1897, p. 116.

maximum 100. These gold or silver areas are laid out with the uniform dimensions of 250 feet north and south and 150 feet east and west. When a claim is made a lease of gold mining land is granted on the annual payment of 50 cents per area, and a royalty of 2 per cent. is charged on the metal produced, gold being officially valued at \$19 per ounce smelted, or \$18 per ounce unsmelted, and silver at \$1 per ounce. In order to encourage alluvial gold mining, an Act was passed in 1898, allowing a grant of 500 areas to any person who expends 40 cents per area within three months, after which a payment of \$250 (£50) secures a prospecting licence over the 500 areas for a year.

Probably there is no other gold-mining region in the world where the precious metal may be obtained in circumstances so comfortable for the miner who does not wish to lose touch with civilisation, and who yet seeks to avoid the turmoil of great cities.

Prospecting licences for other minerals are given for \$30, available for five square miles for a year.

NEW BRUNSWICK.

This province depends mainly on its forests, with which most of the surface is still covered, although the pine, the most valuable tree from the lumberer's point of view, has been nearly exhausted. Maple, beech, and other hardwood trees abound on the higher ground.

The climate of New Brunswick is more continental than that of Nova Scotia, the winters being colder and the summers hotter. The conditions of agriculture are correspondingly more arduous, as the soil is, on the whole, no more favourable. Stock raising and dairy farming are more profitable than grain crops or fruit growing.

The Crown lands, which are mostly rough, undulating ground, covered with forest, may be bought outright in any quantity at \$1 per acre; but free grants of 100 acres are made subject to a certain amount of clearing being done and a house built. The clearing of the land costs from 50s. to 60s. per acre; and, on the whole, the agricultural development of this province does not appear likely to attract the attention of outsiders.

The fisheries are valuable, and the port of St. John does a considerable over-sea trade, and has direct steamer services to and from England.

Coal occurs in the Carboniferous rocks of the province, but it

is inferior in quality to that of Nova Scotia, and less easily worked. The mines are situated at Grand Lake, south-east of Fredericton.

No great finds of gold have been made in the province. Prospectors' licences are issued in the same manner, and on almost the same terms, as in Nova Scotia.

The direct railway from St. John to Montreal passes across the State of Maine, but other lines meet the Inter-Colonial Railway passing entirely through Canadian territory.

PRINCE EDWARD ISLAND.

This is the smallest of the provinces of Canada, and, being a good country for mixed farming, it has been fairly well settled, so that, so far as new land is concerned, it need not be discussed here. The calling of the direct steamers from Milford to Paspébiac at Charlottetown, the capital of the island-province, may possibly tend to improve the commercial position by supplying a ready market to the farmers; but, in default of mineral resources, no very great development is to be looked for.

THE PROVINCE OF QUEBEC.

People.—Quebec is the oldest province of Canada, the direct representative of the original seventeenth century colony of New France, and still the home of a large and increasing French-speaking population. In 1891, out of a total population in the province of 1,488,000, the number of French-speaking Roman Catholics was 1,200,000, leaving 288,000 people of British origin, or, at least, of English speech. The large families of the French Canadians are a matter of great importance in a new country, the principal need of which is population, and it is interesting also to observe that there is a tendency for the return to Canada of French Canadians who had been induced to cross the frontier into the United States. Yet a great movement of population prevails from Quebec to the richer lands of the west.

Climate.—The climate of Quebec is continental in character. The winters are long, with deep snow and severe frosts, the mean temperature during this period being 14° F., and temperatures falling below 0° F. are often registered. From the middle of November to the middle of April the rivers are frozen, and navigation on the lakes is stopped. The only seaport of the province which remains open all the year round is the fine harbour of Paspébiac, on Chaleur Bay, in the Gulf of St.

Lawrence. Except at the time of thaw, in spring, the winter weather is dry, bright, and invigorating, offering no hindrance to such out-door work as lumbering, or to travelling. The summers are hot and dry, the latitude being that of southern Europe. A great variety of fruits which cannot be cultivated in England ripen out of doors. The rainfall is everywhere sufficient for agriculture.

Natural Divisions.—The province of Quebec extends from the boundary of New Brunswick, along the south of the St. Lawrence, adjoining the United States, until the international boundary coincides with the centre of that river above Montreal. The western boundary with Ontario is formed by the Ottawa River and the meridian of $79^{\circ} 30'$ W. as far as James Bay, in Hudson Bay. Thence the northern border lies along the East Maine and the Hamilton Rivers almost to the coast of Labrador, approximately in 53° N. The total area is nearly three times that of the United Kingdom, but at present the population is almost entirely confined to a narrow belt on each side of the St. Lawrence River.

The natural divisions of the province are three in number—
(a) The mountainous country on the United States border south of the St. Lawrence, forming the northern extremity of the Appalachian chain. The rocks forming this chain vary in age from Archæan to Devonian, and contain considerable mineral wealth, while the surface is thickly wooded.

(b) The St. Lawrence Plain runs, between the mountains on the south and the edge of the plateau on the north, from a little below Quebec to the western extremity of the province. It has an area of about 10,000 square miles, upon which almost the whole population is concentrated, the land being for the most part cleared and cultivated. Indeed, there are few parts of Europe which present a richer or more settled appearance, or a closer succession of villages and farms, than does the St. Lawrence Plain between Quebec and Montreal. The portion of this tract south of the river is called the "Eastern Townships," and is mainly settled by an English-speaking population. The soil, formed of glacial sands and clays, is very fertile.

(c) The Laurentian Plateau occupies the whole of the north of the province. The greater part is uninhabited, except by a few native Indians, and much of it is still unexplored and unmapped. The plateau is composed of Archæan rocks, the surface having a mean elevation of from 500 to 2000 feet, and is strongly worn by glacial action. It presents a maze of interconnected rivers and lakes, which form the only lines of communication

with the interior. The rivers flow to the St. Lawrence, to Hudson Bay, and to the Labrador coast respectively.

Communications.—The largest towns are all situated on the St. Lawrence. Quebec, the most eastern, is almost wholly French as regards language and customs. It is the port at which all emigrants to Canada are landed, and has a railway running south-west to Montreal, and another running north to Lake St. John and the Saguenay River on the Laurentian Plateau. The Inter-colonial Railway, on the right bank of the St. Lawrence, is reached by means of a ferry to Levis.

Montreal, 168 miles further up the St. Lawrence, is the largest town of Canada, with a population approaching a quarter of a million. The largest ocean steamers can reach it, the shallows in the river having been dredged out, and it is the great trade emporium of the country. The St. Lawrence is here crossed by the first railway bridge, and lines radiate in all directions—up the St. Lawrence to Toronto and the Ontario peninsula; up the Ottawa to Ottawa and the far west; due south to New York, and east to Quebec and to the Maritime Provinces. The St. Lawrence canal system begins near Montreal, at the Lachine rapids, which form the first obstruction to free navigation from the direction of the sea.

Montreal being the terminus of the Canadian Pacific Railway, as well as of the St. Lawrence canals, is the gateway to western Canada.

Resources.—The main resources of the province are agriculture and lumbering. Both are capable of great extension, although so much attention is given to the farming lands farther west, that little of the rougher country in Quebec has been taken seriously in hand. The breeding of cattle and the manufacture of cheese receive great attention. The St. Lawrence Plain is in every way the fittest for agriculture, and it may be said to be fully occupied. In addition to maize and the ordinary farm crops of temperate countries, tobacco is largely grown, and apples, pears, and plums come to great perfection.

On the Plateau fruit growing is unimportant, and the farmers are content with growing grain and keeping live stock. The provincial government pays great attention to the improvement of agriculture, by establishing and subsidising agricultural societies and shows, farmers' clubs, and organising lectures, as well as by opening agricultural schools.

The growing of plants for industrial purposes, such as the sugar beet, flax, and hemp, might probably be introduced; while the industry of extracting sugar from the sap of the sugar

maple is one that might perhaps be extended. The ginseng trade was once of great importance, but the author has been unable to find if it is still carried on. With the direct service of train and steamer to China now available, it would seem to be worth considering.

The price of unimproved land in the Eastern Townships is from \$2 to \$5 per acre, but it may cost as much as \$15 an acre to clear partially. Improved land costs from \$20 to \$30 per acre, and the system of railways is so good that there is always a ready market for farm produce. This is the only part of Quebec which at present offers great attractions to English-speaking settlers.

In the less desirable parts of Quebec, especially on such parts of the Laurentian Plateau as have been opened up by railways for settlement—*e.g.*, the Lake St. John and Saguenay districts—land may be obtained free of charge. It may also be bought at from 10d. to 2s. 6d. an acre, on certain conditions as to clearing. Any one over eighteen may get 100 acres of uncleared land free, on condition of building a house and having 12 acres cleared within four years. A farm of 100 acres (presumably in a more favourable locality than the ordinary homesteads) may be claimed under a special Act of the provincial Parliament, by the father or mother of a family of twelve living children.

Lumbering.—There is hardly any part of the province, except the cleared portion of the St. Lawrence Plain, without a covering of forest. The white pine of the Ottawa Valley is the most valuable timber tree, and the largest lumbering trade is now carried on in the north-west of the province round Lake Temiscaming. There is no railway to the mining camps in this district, the route lying up the Ottawa Valley. The second great centre of lumbering camps is along the railway from Quebec to Lake St. John, where there are extensive woods of spruce, cedar, hemlock, and birch. As time goes on the timber-cutters have to move farther and farther into the interior, but the limiting condition is always the neighbourhood of a river, to serve as a means of transport for the timber to the market. Hitherto the light coniferous woods which float readily have alone been cut in large quantities, there being no means of carriage for hard wood, which floats deeply or sinks in water. As the only outlet from the country is by the St. Lawrence, timber-cutting is confined to the basin of that river.

Beyond the Height of Land, there lies a vast virgin country richly wooded and drained by great rivers to Hudson Bay and the Labrador coast. The rivers flowing into James Bay are well

adapted for floating timber, and if the navigation of that sea is seriously undertaken, there should be a great future for the timber trade on these northern slopes. Until that is done the forests cannot be utilised. Unlike most of the rest of Canada this region has not been devastated by forest fires, the few travellers who have passed through reporting only small patches of burnt trees.

Here then is a great new land, not yet adequately explored, but from the reports of Mr. O'Sullivan, of the Quebec Land Survey, Dr. Bell, and Mr. Low, of the Dominion Geological Survey,* a region of vast resources. When cleared, the ground will in most cases form good agricultural land, there being many extensive deposits of rich clay soil; but the time when the land can be divided out into farms is still far distant.

At present the only part of the Laurentian Plateau to be made available for settlers is in the Lake St. John region; but when railways are extended northward great developments may be expected in the Lake Temiscaming district and the Keepawa region west of it, as well as in the more remote regions to the north.

The timber industry in Quebec is carried on by virtue of licences to cut wood issued by the provincial government, and a royalty is payable on the timber cut, which is measured for the purpose by a Government agent attached to each lumbering camp.

Minerals.—Quebec suffers perhaps more than the other provinces from the neglect which mining has hitherto met with in Canada, and the available mineral wealth of the province is still practically unknown, while the statistics of actual mining are very unsatisfactory. Indications, however, are not wanting that there is a future for mining.

Gold has been worked to a small extent in the auriferous gravels of the Chaudière River, on the south of the St. Lawrence, and some attempts have been made at quartz mining in the county of Beauce, in the Southern Highlands. So far as is known at present there is no large deposit of gold in the region. In the northern districts, especially in the rivers flowing to Hudson Bay, promising traces of gold have been reported, and it would certainly be worth the while of prospectors to pay attention to that region, where it is quite probable that goldfields may exist; and if not gold other minerals of value are almost sure to be found. When once gold or some other

* "Geological Survey of Canada," Annual Report, vol. viii. (1896), Part I.; also *Geographical Journal*, vol. x. (1897), p. 1.

valuable mineral has been discovered, a railway could easily be constructed to reach the deposit and the existing timber industry, and the prospective agriculture that would be thus aided in their development promise prosperity to the country, even should the mines become exhausted. Dr. Bell says of the northern region* :—"The Huronian rocks, which constitute our most productive ore-bearing system, are largely developed within its borders. The great belt of these rocks, mingled with eruptive greenstones and granites, which runs from Lake Superior to Lake Mistassini, attains its maximum width in this region, and measures 150 miles on a line drawn straight north from the head of Grand Lake to Lake Mattagami. A considerable proportion of the Huronian system of the district consists of various kinds of crystalline schists and pyroclastic rocks. These and the greenstones are intersected by numerous veins of quartz, many of which have a promising appearance for gold. Iron pyrites in economic quantities, and containing copper, was found in several localities on the Broadback River."

Silver, in small quantities, and *Copper* are obtained from the copper pyrites in the Capelton district of the Eastern Townships, the ore being used mainly for the production of sulphuric acid. The metals are not reduced in Canada, but are exported as ore or matte to the United States.

Iron is widespread in the form of bog ore, and other ores also occur, but they are mined and smelted only to a small extent. Magnetite and hematite could be largely extracted if there were a market, but tariffs restrict exports to the United States, and there is no coal supply in the province. It might be found profitable to send the fine ores to Nova Scotia for reduction, if the iron industry of Canada were taken up energetically. Chrome iron ore is mined to some extent in the Eastern Townships for export to the United States.

Though coal is apparently quite absent from Quebec, and very little petroleum or natural gas occurs, there are immense deposits of *Peat* which have not yet been utilised. How far it would be profitable to compress and dry this peat for fuel depends rather on the state of the market than on the nature of the raw material.

The Thetford district of the Eastern Townships is the greatest *Asbestos* mining district in the world, the mineral occurring in veins in solid serpentine. In 1896 about 12,000 tons were raised. The demand for asbestos is steady, and the production will doubtless be increased.

* *Geographical Journal*, vol. x. (1897), p. 12.

Mica is extensively mined in the Ottawa valley, and phosphates, which are occasionally worked for the manufacture of fertilisers, also occur in that region, although not as yet exported in large quantities. The land in the neighbourhood is, moreover, still unexhausted, and does not demand manure.

The present low standard of mineral production in Quebec does not seem likely to last, and it may confidently be stated that the vast northern region in particular will repay careful prospecting, for hitherto the Eastern Townships and the neighbourhood of the large towns alone have been properly examined.

Mining Laws.*—In Quebec mining rights are held to be property separate from the land on which the minerals are found. Mining concessions are divided into three classes, which differ in unsurveyed and surveyed lands.

(1) In unsurveyed territory a concession of the first class comprises 400 acres, one of the second class 200 acres, and of the third 100 acres.

(2) In surveyed townships the classes contain four, two, and one lots respectively.

A single individual can acquire mining rights over more than 400 acres only in exceptional cases, when the Governor in Council may increase the holding to 1000 acres, which is the maximum allowed in such cases. Crown lands of mineral value are obtained from the Commissioner of Colonisation and Mines, either as mining concessions by purchase, or on the condition of being occupied and worked under a mining licence. In the sale of mining lands there are conditions as to commencing work within two years of purchasing, and expending a certain minimum sum in developing the mines. Minerals are divided for the purpose of land sales into two groups, somewhat inaccurately termed "superior metals" and "inferior metals." Land containing the "superior metals" (which include gold, silver, lead, copper, nickel, graphite, asbestos, mica, and phosphates) are sold at \$10 (£2) per acre if within 12 miles of a railway, and \$5 (£1) if more than 12 miles from a railway. Lands containing the "inferior metals" (which include all minerals not enumerated above) cost from \$4 to \$2 per acre.

Exploration and prospecting licences cost from \$2 to \$5 per 100 acres if on surveyed territory, and \$5 per square mile in unsurveyed territory, the licence being valid for three months, and renewable. Such a licence implies an option of purchasing any lot on which minerals may be discovered.

* From the *Statistical Year Book of Canada* for 1897.

It is to be presumed that exploration and prospecting in the unexplored territory to the north of the province is unhampered by Government restrictions, which, indeed, it would be impossible to enforce in that region.

THE PROVINCE OF ONTARIO.

Access and People.—Ontario is practically an inland province, for it only touches the sea on the southern shore of Hudson Bay, and the rapids of the St. Lawrence prevent large ocean-going vessels from reaching its borders. The system of canals, now being improved on a regular system, admits smaller vessels to the great lakes, which are themselves navigated for eight months in the year by large lake craft of considerable tonnage. The lakes afford a coast line of over 1700 miles in Ontario.

This province offers a great contrast to Quebec in the character of its population, which is mainly of British origin, although Canadian born. A considerable number of the people are descended from the United Empire Loyalists, who left the United States at the close of the revolutionary war in order to remain British subjects. English is practically the only language used in the province, the alien elements being rapidly assimilated; while the laws of the province are derived from the English common law, and not from the old French law, as in Quebec. The large city of Toronto, on Lake Ontario, is more akin to those of the United States than any other town of Canada, and is a centre of great industrial and commercial activity.

Natural Divisions.—Ontario lies entirely to the north of the St. Lawrence River, and the central line of the great lakes—Erie, Ontario, Huron, and Superior. It is separated from Quebec by the Ottawa River and the meridian of $79^{\circ} 30' W.$ up to James Bay, while the Albany River, flowing into that bay, with Lakes St. Joseph and Lonely, separate it from Keewatin on the north. In the west, the Rainy River forms the international frontier, and Ontario meets Manitoba on the Lake of the Woods.

The surface of the province is of an undulating character, with neither mountains nor great elevations, the watersheds being usually marked by no prominent ridges. The portion surrounding James Bay, unlike the adjoining part of Quebec, is made up of Silurian and Devonian limestones, which present little surface relief, and the district is swampy, thinly wooded, and practically without white inhabitants.

The greater part of the province, like Quebec, lies on the Laurentian Plateau, part of the great Archæan axis of the continent, made up of the much contorted Laurentian and Huronian rocks. The Huronian rocks, with the igneous intrusions which characterise them, are of peculiar importance on account of the mineral wealth they contain. The Laurentian Plateau comes down to the coast of Lakes Huron and Superior, and stretches to the Lake of the Woods. In the south-west it contains some hilly scenery of a bold type, but the prevailing character of the formation is a succession of gently undulated hills and hollows, much modified by ice action. The summits of the hills are usually almost bare rock with a very thin covering of vegetation, but in the valleys there are valuable forests of spruce and pine, which also flourish on the glacial and lacustrine deposits which fringe the borders of the lakes. This vast area is just beginning to be peopled.

The prolongation of the St. Lawrence Plain occupies a comparatively small area along the St. Lawrence, east of Lake Ontario, and this is not as yet thickly settled except in favoured parts.

The fourth natural division of Ontario is the peninsula projecting southward of the Laurentian Plateau between Lakes Ontario, Erie, and Huron. It is mainly underlain by horizontally stratified Silurian and Devonian limestones and other rocks, which, however, are in most cases thickly covered by glacial and lacustrine deposits forming a remarkably fertile soil. This is the most thickly settled part of the province, and perhaps contains the very best land in Canada, while it is actually the most southerly part of the Dominion extending to 42° S.

The rivers of Ontario, except those forming the boundaries, are comparatively unimportant, although the Abittibi and Moose rivers, and others flowing into Hudson Bay may ultimately become useful.

Climate.—The climate of the different parts of the province differs greatly. On the whole it has a more marked continental character than that of Quebec. North of Lake Superior the winter is very severe, the thermometer occasionally descending to - 50° F. The snow does not usually vanish from the forests until May, but the summer comes on quickly and is warm, the weather for four months being delightful. In September frosts begin, and by November navigation on the great lakes has ceased. Farther east, towards the Ottawa valley, the winters are less severe, and, although 0° F. is a common enough tem-

perature, the air is particularly exhilarating. The Ontario peninsula has a milder, although still cold winter, but the severity of the season is tempered by the surrounding lakes, the temperature of which, of course, never falls below the freezing point. The summers are decidedly hot, resembling those of southern Europe, and fruit of many kinds ripen admirably. Snow does not cover the ground permanently until about the middle of December. The rainfall for the province, as a whole, is between 30 and 40 inches, well distributed throughout the year. The summer rainfall comes for the most part from passing thunderstorms, and cloudy days are uncommon at all seasons.

Communications.—For the transport of grain and timber the shipping of the great lakes during the open season is very important, and will increase in importance when the canals connecting the lakes with the St. Lawrence have been deepened, and the locks enlarged to admit vessels of 14 feet draught.

The railway system of the Laurentian plain and the peninsula is highly developed. The lines of the Grand Trunk system run from Montreal along the St. Lawrence and Lake Ontario to Toronto, whence they radiate over the peninsula, and make many junctions with the lines of the United States. The north of the province is untouched by the railway, but the Canadian Pacific line from Ottawa branches at Sudbury, one line running into the United States at Sault St. Marie, and the main line continuing along the northern shore of Lake Superior to the Lake of the Woods where it enters Manitoba.

Laws.—The laws of Ontario are in some ways more repressive than in the other provinces. Sunday observance is enforced by the prohibition of labour in bakehouses, and by the prohibition of all sales and of pleasure excursions, either by railway or steamer, on that day. The liquor trade is carried on under licences which will be refused if against the wish of a majority of the ratepayers; and drink must not be sold to persons under twenty-one years of age, nor tobacco to persons under eighteen. How far these regulations are enforced it is difficult to say, but in some places within the province the liquor laws and the rules for Sunday observance were certainly not rigorously interpreted in 1897.

Resources.—Farming is the chief industry of Ontario, and, as in the other parts of Canada, the tendency is to depend less on cereals and more on animal produce, especially upon the manufacture of cheese and butter, both of which are produced in very large quantities. In 1898 there were over 2,200,000

head of cattle in the province, 965,000 of which were milch cows, with about 1,600,000 sheep and 1,500,000 swine. In addition to ordinary farm produce, tobacco is grown to a considerable extent, and grapes, peaches, tomatoes, as well as commoner fruit, thrive well in the peninsula. It may be said that the rich land of the Ontario peninsula is fully taken up, and that only farmers with experience and capital need hope to make their way there. On the other hand, the reputation of the district induces many who intend to take up new land in more remote situations to learn their trade from the Ontario farmers, or at the admirable provincial agricultural college at Guelph. The farming of eastern Ontario, where the ground has long been cleared and cultivated, is the most scientific and prosperous in Canada.

New Agricultural Land.—As the Canadian Pacific Railway runs for almost a thousand miles through the unalienated Crown lands of the province, there is easy access to a large belt of country. Most of the land is covered with forest, or the remains of forests devastated by fire; but, even if cleared, much of it is so rocky as to be almost valueless for agricultural purposes. Still, here and there, there are patches of good land, and occasionally large areas presenting all the conditions required for successful settlement. The pine on land sold or granted to agricultural settlers remains the property of the crown. The settler is allowed as much as he requires for building purposes, and all other kinds of timber becomes his absolute property. To pioneers content to work hard and live in solitude, the creation of new farms in Ontario offers some advantages, although perhaps less than in Manitoba or in the Territories. The available portions of the 106,000,000 acres of provincial lands cannot be more concisely described than in the words of Mr. T. W. Gibson, Secretary of the Bureau of Mines in Toronto, in the *British Association Handbook to Canada*, 1897 (pp. 216-218):—

“1. In the districts of Muskoka, Parry Sound, Haliburton, and Nipissing, and parts of the counties of Peterborough, Hastings, Frontenac, Addington, and Renfrew. Between five and six millions of acres in these districts have been opened for settlement, mainly under the provisions of the Free Grants and Homesteads Act, which give an actual settler 100 acres if he be a single man, or 200 acres if the head of a family, free of cost, on his performing settlement duties. These consist of five years' residence, clearing and cultivating at least 15 acres, and erecting a habitable house. Much of these sections is rocky, and not adapted for tillage, but there are many arable

areas, and the running streams and nutritious grasses which abound give ample scope for dairying and stock raising.

"2. At various points along the main line of the Canadian Pacific Railway, in the districts of Nipissing and Algoma, such as Mattawa, North Bay, Sturgeon Falls, Sudbury, and Sault Ste. Marie, also on St. Joseph and Manitoulin Islands (the latter administered as Indian lands by the Dominion Government). About 900,000 acres contiguous to these several places are offered to settlers, partly as free grants, but mostly for sale, at 20 or 50 cents per acre. Three or four years' residence, the erection of a habitable house, and clearing and cultivating 10 per cent. of the area, are required previous to the issue of the Crown patent. Broken land is here also the rule, though there are many tracts well suited for farming, and some well-settled and prosperous neighbourhoods.

"3. At Port-Arthur, where there are several free grant townships, and at Dryden, on the C.P.R., between Port-Arthur and Rat Portage, where two townships have been opened for sale, and two others recently surveyed and laid out. There is a large area of strong clay land here, equal in extent to a good-sized county, easy to clear, and free from boulders. A pioneer farm, started by the Department of Agriculture in 1894, has led to a considerable settlement, and a large amount of land being taken up. The price is 50 cents per acre, and the usual settlement duties are required.

"4. In the valley of the Rainy River, in the north-western part of the province, the Ontario side of which comprises a fertile alluvial belt of 500,000 or 600,000 acres. This section is one of much promise, as the gold-mining industry of the Rainy Lake and Seine River regions, now being rapidly developed, will afford an excellent market for agricultural products. There are twenty townships open for settlement under the Free Grants Act. Continuous steamer navigation connects Fort Frances, at the foot of Rainy Lake, with Rat Portage, on Lake of the Woods.

"5. On Lake Temiscaming, where at least 500,000 acres of rich calcareous subsoil, covered by many inches of vegetable mould, is found in one block stretching to the north and north-west of the lake. Twenty-five townships have been surveyed, of which five have been placed on the market at 50 cents per acre to actual settlers. The timber is mostly small, and the land is not difficult to clear. Considerable settlement is now going in.

"Besides these areas now available, there are many others

of greater or less extent which are yet inaccessible, or too remote from markets to be of immediate use. One of these is a tract of land containing many thousands of acres, well adapted for settlement, discovered in 1896, near the upper waters of the Montreal River, by an exploring party sent out by the Department of Crown Lands. In the valleys of the great rivers running northward into James Bay, or on the tablelands between, there is reason to believe large areas of good agricultural land exist."

Timber.—The resources of Ontario in forests yielding timber and wood for pulp manufacture were formerly enormous, and are still great. Reckless timber cutting and the prevalence of forest fires have already caused a great waste of wealth, and even reduced the agricultural value of the land too thoroughly cleared. When it is remembered that a very large part of the province is unfit for tillage, and not likely to contain mineral wealth, the loss of the old timber is seen to be an irremediable disaster. Attention on the part of the Government is only now being directed to this criminal waste of the resources of the country. Professor Macoun says:—*

"Twenty-five years ago the Algoma district, over 1000 miles from east to west, and, we may say, 200 miles from north to south, was a solid coniferous forest. To-day most of it is so completely denuded of trees, that even the dead and whitened trunks of some localities have disappeared, and nothing is to be seen for miles but bushes and young trees growing in the crevices of the naked rocks, repeated fires having burnt up every particle of the former covering, which was the accumulation of ages."

Professor Macoun looks on the lumbering industry in Ontario as less than a doubtful benefit to the country, considering that in the interest of the people of the future the dwindling forests ought to be protected, and not further depleted and destroyed.

The region where lumbering is now carried on most extensively is in the Ottawa Valley, close to the Quebec frontier, and particularly on the shores of Lake Temiscaming, which is reached by river steamer from the station of Mattawa, on the Canadian Pacific Railway. The outlet for the timber is by river to Ottawa, where the principal saw mills of the province are situated. A good deal of lumbering is also done in the district of Algoma, north of Lake Superior, and a great wood-pulp mill is established at Sault Ste. Marie, by the side of the Canadian "Soo" Canal. The most westerly lumbering camps are in the neighbourhood of the Lake of the Woods, and the timber is

* *Handbook of Canada*, Toronto, 1897, p. 276.

sawn up near Rat Portage, and mainly utilised in the locality, or sent by rail to the treeless districts of Manitoba and the North-West Territories.

Untouched forests cover a considerable part of the drainage area to Hudson Bay; but these are still inaccessible and unexplored.

Fisheries.—The fine whitefish of the great lakes are superior in flavour to the Canadian salmon, and give rise to a considerable local industry. When better known in other countries there seems to be no reason why a great canning industry should not be developed on the lakes, the supply being vast and the fishing trade by no means fully developed. The sturgeon is also a valuable fish, and not uncommon. There is some trade in the roe or caviare on the Lake of the Woods, and if proper attention be paid to the preparation, Canadian caviare might compete openly with that of Russia; it is whispered that already not a little caviare on the continental European markets sold as Russian is in reality “made in Canada.”

Mining.—The prosperity of Ontario will largely depend upon the manner in which the vast mineral resources of the province are made available. If wisely developed, in conjunction with agricultural settlement, the mines of Ontario should be a source, not only of Canadian, but also of imperial prosperity. At present a great part of the capital employed in the mines is derived from the United States, and the final metallurgical processes are, for the most part, carried on in the latter country. The fact that the mineral wealth of Ontario is only beginning to be utilised, and that the discoveries have not been of a sensational kind, may perhaps account for the small amount of British capital invested; but the work of the Geological Survey has demonstrated that there are few richer metalliferous regions in the world. The absence of coal is the most serious drawback, nor is there much likelihood of any being found in the future, for there are no strata in the province newer than the Devonian, except the glacial and lacustrine deposits, in which a little lignite sometimes occurs. Near Sudbury large veins of a curious mineral, which closely resembles anthracite, but is more nearly pure carbon, have been found. It has been termed anthraxolite, but its value as a fuel and the extent of the supply are not yet known. The conditions, in fact, are not unlike those prevailing in the metal-mining regions of Norway and Sweden, and either imported coal—which can readily be obtained at the lake ports from the United States—has to be used, or else charcoal from the forests, or electrical energy derived

from water-power must be employed, and neither of these have as yet been essayed to any extent. Petroleum occurs in large quantities in the Ontario Peninsula, where natural gas wells are also in use, and oil has been found on Manitoulin Island. The supplies are being worked to their full extent.

Corundum.—The valuable abrasive mineral, corundum has been found by the Geological Survey, in 1897,* to be widely distributed in the counties of Hastings and Renfrew (situated between the Ottawa River and Lake Ontario), in a well settled country, where labour and supplies are cheap and plentiful, and where water power is abundant. The deposits crop out at many places, and access to them may be had from Barry's Bay, a station on the Ottawa, Arnsprior, and Parry Sound Railway, about 108 miles west of Ottawa. A steamer runs from this station on Kaminitkeg Lake and the York River to Havergal. Scarcely a year passes without some similar discovery of minerals, valuable for industrial purposes, and for the profitable working of which only experience and capital are required.

Iron.—Iron ore of good quality occurs abundantly, and the provincial government offer a bounty of \$1 per ton on pig iron produced in Ontario from ores mined in that province, this being in addition to the bounties offered by the Dominion Government. In 1896 there was one blast furnace at work in Hamilton, and in that year 15,000 tons of iron ore were raised in the province. Formerly there was a considerable export of magnetite and hematite to the United States, but this has ceased owing to a hostile tariff. There are extensive deposits of those valuable ores in western Ontario.

Copper and Nickel.—Copper ore occurs in veins on the north of Lake Superior and Lake Huron. In the latter locality it was formerly worked to some extent, but this source of supply has scarcely been touched for the last twenty years. At present copper is mainly obtained, combined with the much more valuable nickel, from the ores of the mines at Sudbury. In the *matte*, as produced in the mines by roasting and smelting the sulphide ores, copper and nickel occur in nearly equal proportions. The *matte* is sent to the United States for further reduction.

The only other region in the world where nickel is produced in any quantity is the French Australasian colony, New Caledonia.

Nickel ores occur in vast quantities in the Sudbury district,

* *Summary Report of the Geological Survey of Canada for 1897*, Ottawa, 1898, pp. 48-56.

on the margin of the masses of intrusive rocks of Huronian age, the ore consisting mainly of a mixture of pyrrhotite (magnetic pyrites) and copper pyrites, which contains from $2\frac{1}{2}$ to 10 per cent. of nickel. Pyrrhotite also occurs in other parts of the country, where it is found in association with Laurentian rocks, and is almost free from nickel. The Sudbury deposits were discovered in 1883, while a cutting was being made on the Canadian Pacific Railway.

The importance of nickel is not only as an alloy in "German silver," as a cheap and durable plating for exposed metal work, and as a material for cooking utensils, but mainly as an alloy with steel. When present in the proportion of 2 or 3 per cent., it renders this metal extremely hard, and therefore peculiarly suited for the manufacture of armour-plate for war-ships and forts. It would consequently be of material importance to Canada, and to the British Empire generally, if this metal was refined in the country of its production.

Silver and Platinum.—Small quantities of platinum occur in the Sudbury nickel ores, and the metal has been recognised by prospectors in the form of an arsenide called sperrylite in the same neighbourhood; but it has never been produced on a paying scale. Silver was formerly worked to a considerable extent, the ores in the north-west of Lake Superior being very rich in native metal as well as argentite and other silver-bearing minerals. Mines were worked on the mainland west of Thunder Bay, and, in particular, on Silver Islet in that bay; but the flooding of the chief mine, and the fall in the value of silver, have put a stop to the work, and practically no silver is now produced in the province, although the industry will probably be revived.

Gold.—The prosperity of Ontario, so far as mineral products are concerned, is now due mainly to the extensive goldfields which have recently been surveyed and exploited in the west of the province. The fact that alluvial gold is not found makes it impossible for individual miners to work profitably, and the utilisation of the supplies necessitates the employment of experience and capital. Professor Coleman, of Toronto, who has carried out extensive geological investigation in the gold-producing districts, thus sums up his opinion of the value of the mines in Western Ontario:—*

"Unlike the adjoining province of Quebec, Ontario contains no placers, the whole of the gold being obtained from quartz veins found at or near the contact of bands of Huronian schist,

* *Handbook of Canada*, 1897, pp. 308, 309.

with areas of Laurentian gneiss or granite, or eruptive bosses of the latter rock. Gold has been found at various points for nearly a thousand miles along almost the whole length of the northern Archæan portion of the province; but the richest and most numerous finds have been made in a region 250 miles long and about half as broad, lying to the west of Lake Superior. The returns of gold for the province are somewhat less than \$33,000 for the year 1893, and the same for the following year. In 1895, \$50,281 were produced, while the sum for eleven months of 1896 was \$142,605, an average of \$14.83 per ton of ore crushed, whereof \$12.30, or 83 per cent. of the whole, was free milling.

"There is every prospect that a number of mines will be producing gold in 1897,* and that the total will rapidly increase. The area of auriferous country is so enormous, and the ores, as a whole, so easily treated—being like those of Nova Scotia, mainly free milling—that within a few years a very large output may be expected."†

The actual position and accessibility of the new goldfields may be briefly stated. In most cases they promise permanent development to the country, as gold-bearing quartz requiring heavy machinery for its treatment is not usually soon worked out, and the demand for timber and supplies will tend to attract settlers, who will be firmly established before the mines are exhausted. Most of the land now being prospected or worked for gold lies to the north and west of Lake Superior, and is reached from various stations of the Canadian Pacific Railway, or, in some cases, from ports on Lake Superior.

The nearest of the new goldfields is at Michipicoton, near Lake Superior. It is at present reached only by canoes from Missanabie Station, on the C.P.R., a distance of about 70 miles; or by a short canoe trip from Michipicoton itself, a calling place for the Lake Superior steamers, 75 miles from Sault Ste. Marie. It is a new, but promising field.

Good gold-bearing quartz has been found near the station of Jack Fish Bay, and the next centre is Wabigoon, on the C.P.R. Auriferous quartz occurs in the district to the north, but it would appear not in paying quantity.

To the south there is gold along the Manitou Lake, and out-crops occur throughout all the Huronian rocks, as far as the international frontier. In summer communication is only possible by canoes, with frequent portages, so that machinery

* This forecast has since been confirmed.

† *Bulletin No. 1, Bureau of Mines of Ontario.*

can only be transported in winter over the snow. The most developed mines are reached through Rat Portage, a station on the C.P.R., at the outlet of the Lake of the Woods. Some of the best locations are in the immediate neighbourhood, and an immense extent of gold-bearing country is reached by the small steamers which ply upon the lake. Fort Frances, on Rainy River, which flows into the Lake of the Woods from the south-east, is reached by steamer from Rat Portage in two days. It is at the outlet of Rainy Lake, and forms a centre whence steamers ply to Lake Manitou and the Seine River, both traversing country rich in gold-bearing quartz, and now dotted by little settlements and active mines. Throughout the whole of these districts timber is abundant, the water supply is ample for washing the crushed ore and for the supply of electric power, and agricultural settlement is beginning. The whole region has been mapped by the Geological Survey, and the prospectors have learned to use the geological maps, to aid them in their search. The rock is frequently thickly covered with moss, and some of the richest gold quartz has been discovered by accident. Professor Coleman narrates the discovery of a rich vein on Shoal Lake, west of the Lake of the Woods, on the Manitoba boundary* :—"An Indian, crossing the portage from Helldiver Bay, which lies a mile to the south, dropped his axe as he came down to the landing at Bag Bay, and thus knocked off some moss. Stopping to pick up the axe he saw something glitter, and picked up several specimens, which he brought to Mr. Bunn, Hudson Bay officer at Rat Portage. The pieces brought in were brilliant gold specimens."

The working of goldfields, such as those of western Ontario, requires skill, experience, and capital, and is not always remunerative at first, as the following table, from the report cited above, shows :—

GOLD PRODUCTION IN ONTARIO.

	1892.	1893.	1894.	1895.
Ore mined, . . . Tons,	3,710	5,560	2,428	6,500
Gold product, . . . Ozs.,	...	1,695	2,022	3,030
Gold value, . . . \$	36,900	32,950	32,776	50,231
Wages paid for labour, \$	22,750	49,027	38,032	56,234

* *Fifth Report of the Bureau of Mines (of Ontario)*, Toronto, 1897, p. 8.

The Statistical Year Book of Canada for 1897 (p. 137), however, gives entirely different figures for the total gold value of Ontario. The discrepancy may be partly explained by the year in the two cases being calculated from different dates.

Year, . . .	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Gold value,	\$2,000	7,118	14,637	39,624	62,320	115,000	189,294

In 1898 the value of the gold produced was \$275,000.

Mining Laws.—Royalties on all ores raised in Ontario are payable to the provincial government, the rate not exceeding 2 per cent. of the value at the mine after deducting cost of production, if the lease was granted before January 1st, 1900, and not exceeding 3 per cent. if granted after that date, but royalties are not imposed or collected until seven years after the date of the patent or lease.

No licence is required for exploration or prospecting on any Crown land which is not staked out, occupied, or withdrawn from sale by an Order in Council. Crown lands supposed to contain minerals may be sold as mining locations, or when situated in a mining division, may be staked out and worked as mining claims under a miner's licence.

Mining locations are rectangular areas, containing not less than 40 acres, and are sold at the following rates:—If in a surveyed township within 6 miles of a railway, \$3 per acre; if beyond 6 miles, \$2.50. In unsurveyed lands the rates go down to from \$2.50 to \$1.50 per acre; but in all cases the location reverts to the Crown unless, at least, \$1 per acre is expended in actual mining operations in the first two years, and \$1 per acre each year for the five following years. Mining lands may also be acquired on lease from the Provincial Government.

Miners' licences, in territories set apart as mining divisions, are granted for \$10 for one year, renewable at the same rate for the next, and, if desired, the miner may acquire the land on fulfilling certain conditions as to working it. The claims which may be selected and staked out by miners may be either 15 or 20 chains square ($22\frac{1}{2}$ or 40 acres).

CHAPTER V.

THE DOMINION OF CANADA — WESTERN
PROVINCES AND TERRITORIES.

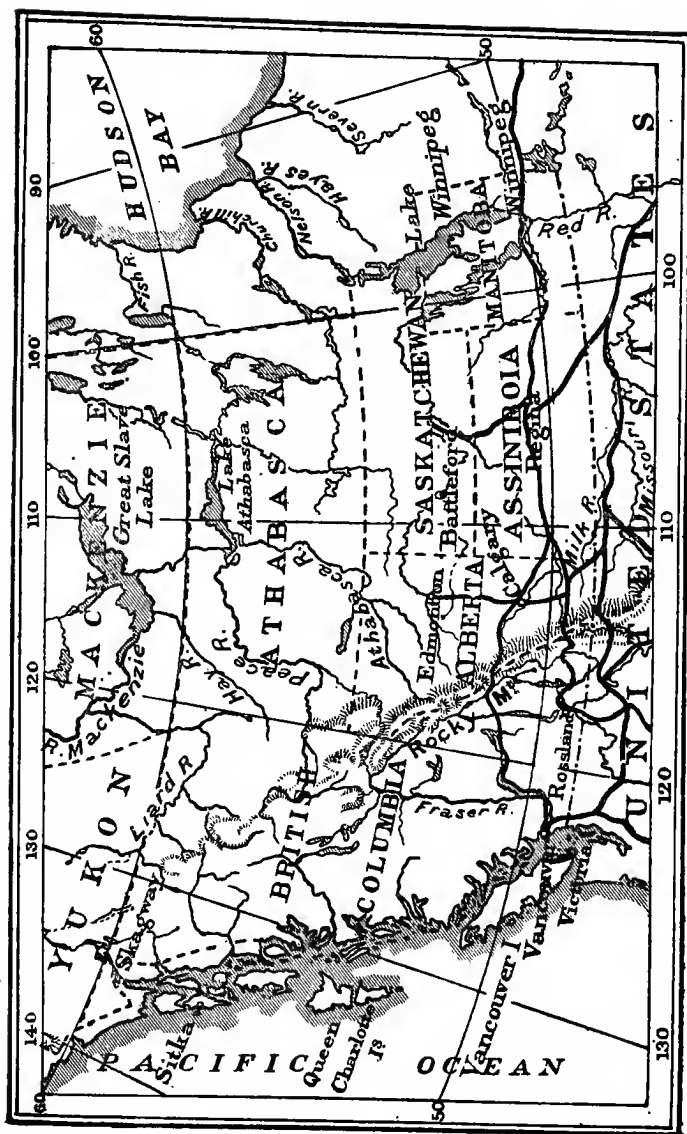
Manitoba — Surface — Climate — Communications — Laws — Minerals — Forests — Fisheries — Agriculture — Settlements and Farms. **Organised Districts** — North-West Territories — Assiniboia — Saskatchewan and Alberta — Climate — Communications — Laws of the Territories — Forests — Minerals — Mining Laws of Manitoba and the Territories — Farming and Ranching — Irrigation — Future Development. **Remote Territories** — Athabasca — Mackenzie, Keewatin, and Ungava — Reported Mineral Wealth. **Yukon Territory** — Position — Climate — Resources — Routes to Klondike — Conditions of Life in the Klondike Region — Mining Regulations. **British Columbia** — Position and Surface — River System — Climate — Communications — People and Laws — Forests — Agriculture — Fisheries — Mining — Gold and Silver — Mining Laws.

THE PROVINCE OF MANITOBA.

Surface.—Manitoba occupies very nearly the centre of the North American continent, and is the youngest province of the Dominion. From an economic point of view, it differs materially from the eastern provinces, where capital and experience are required in developing the land, and where the resources are various, for in Manitoba it is labour rather than capital which is required for individual success, and the whole value of the country lies in its agriculture, and in industries directly connected with farming.

The province is nearly square in outline, with sides about 270 miles in length, and extends from the international boundary, 49° N., to latitude 52° 45' N., and the eastern and western boundaries may be given approximately as 95° and 101° W.

The province may be divided into three natural regions, the boundaries of which run approximately in a north-west and south-east direction. The first of these is the end of the Laurentian Plateau of Archæan rocks, lying entirely to the east of Lake Winnipeg. It has the characteristic appearance of the plateau everywhere, an undulated rocky surface with numerous



Scale of Miles

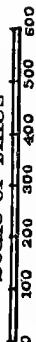


Fig. 3.—Map of Western Canada.

lakes and rivers, and scattered forests of the sub-Arctic type. A little more than half the area of the province is occupied by the dry bed of an ancient glacial lake, the flat surface of which is now known as the First Prairie Steppe. The soil is, for the most part, a rich clay, forming the most fertile wheat land in the world. Lakes Winnipeg, Winnipegosis, and Manitoba occupy hollows in the northern part of this belt, while the southern portion is traversed from south to north by the navigable Red River of the North flowing from the United States to Lake Winnipeg. This region is bounded westward by the Manitoba escarpment, a belt of steeply sloping land which leads up to the Second Prairie Steppe, an elevated region of more pronounced variety of type, having deep river valleys and occasional hills. The surface for the most part is covered with good soil, but except along the river banks, the general surface of both prairie steppes is without trees.

The general elevation increases from 700 feet in the Red River valley, to about 1500 feet at the western boundary, the general slope of the country being thus from west to east. The river system is in accordance with this configuration, the streams flowing from west to east towards the lakes, all of which, except in the extreme south-east, drain to Hudson Bay. The chief river is the Assiniboine, which, entering the province about the middle of the western border, runs at first south, and after receiving the Qu'appelle from the west, turns towards south-east, and finally runs eastward till it enters the north-flowing Red River.

Climate.—The climate of Manitoba is undoubtedly severe, although it is found not unhealthy. The air is remarkably dry at all seasons, and the rainfall is much smaller than in the eastern provinces; $17\frac{1}{2}$ inches may be taken as about the average. Nearly three-quarters of the whole annual precipitation takes place between April 1st and October 1st, so this small annual fall suffices for agriculture, as it occurs while growth is active. The temperature in summer is higher than in any part of England, the average for July at Winnipeg being 66° , but the cold in winter is intense, the average temperature for January being -5° F., and the mercury is frequently frozen (below -40°). The snowfall is lighter than in the eastern provinces. Winter begins early, sharp frosts being frequent in September, and perhaps the greatest drawback to agriculture is found in the spring and early autumn frosts which occasionally occur. Summer thunderstorms also do occasional damage, but there seems to be an entire absence of the winter blizzards and

the summer tornadoes which are so destructive in the prairies and the great plains of the United States.

Communications.—The navigable Red River, and its tributary the Assiniboine, played their part in the first development of Manitoba, and determined the site of Fort Garry, which has grown into the city of Winnipeg at the junction of the two rivers, and of Lord Selkirk's Scottish colony, planted in the then nearly inaccessible wilderness in 1812. Later, the route to Winnipeg was by rail through the United States and steamer down the Red River; and when, in 1870, a route through British territory had to be found for Lord Wolseley's military force to put down the Red River rebellion, the journey was made in boats with frequent portages through the Lake of the Woods, and by the Winnipeg river. With the completion of the Canadian Pacific Railway in 1884, the importance of the waterways was at once diminished, and Winnipeg grew rapidly to be a great railway centre. It is 1424 miles from Montreal, and 1482 from Vancouver; the actual half-way station is Marquette, 29 miles farther west, which is 1453 miles from each of the terminal ports. Most of the railways were constructed on the land-grant principle described on page 50, and they have mainly been built with the view of opening up the province and adjoining districts, and carrying the farm produce to Winnipeg. Small towns have grown up at important points, and the general railway system may briefly be described as follows :—The main line of the C.P.R. runs for 102 miles in the province before reaching Winnipeg from the east, and for 212 miles farther along the Assiniboine valley, passing Brandon, the second town of the province, 133 miles from Winnipeg. The line approximately follows the parallel of 50° N., and in the belt of country about 70 miles wide, which stretches southward to the United States frontier, there are two other parallel lines from the Red River to the western boundary, while a fourth line runs parallel most of the way. Thus no part of the southern third of Manitoba, west of the Red River, is more than 20 miles from a railway, and few are more than 10; while the stations on all the lines lie very near each other.

From Winnipeg two lines, one on each side of the Red River, run south into the United States, and a railway running south-eastward to Duluth is projected. The north of the province is gradually being penetrated by lines which are being extended from Winnipeg, Portage-la-Prairie, and the neighbourhood of Brandon. The projected Hudson Bay line is planned to run between Lake Winnipeg and Lakes Manitoba and Winnipegosis,

and if the navigation of that sea is seriously undertaken, it should prove a vast benefit to the country, affording an outlet for the grain or flour to be exported.

Roads are scarcely necessary in the open prairie country, across which "rigs," or light four-wheeled vehicles, can be driven in any direction; and, as in all steppe countries, many horses are kept in proportion to the population. Manitoba is, however, essentially a province for railways, and already there are very few, if any, regions of so recent development which have been so largely covered with a network of lines, the total mileage open in the province in 1897 having been 1557.

Laws.—In Manitoba the restrictive laws regarding the sale of liquor and tobacco are similar to those of Ontario. The observance of Sunday is enforced by somewhat severe penalties. All sales on that day are unlawful, no games or public amusements for which an entrance fee is charged are permitted, and work (except "work of necessity or charity") is strictly prohibited. In 1897 a man was imprisoned at Portage-la-Prairie for working on his own farm on Sunday; his defence, that he kept the seventh day of the week as a day of absolute rest, being held of no avail.* This seems to be a mistaken policy, for the Canadian Government, in encouraging immigration, has offered special inducements to the settlement of persons whose heterodox religious views subjected them to persecution in their native countries. To such immigrants legislative regulations as to the day of the week to be held sacred must bear an unpleasant resemblance to the persecution from which they had fled.

As in most parts of Canada, workmen have a lien on the produce of their work for the payment of their wages.

Minerals.—The minerals of Manitoba are of very little importance at present, and will never compete with the mineral resources of other provinces. Gold-bearing Huronian rocks occur in the east, and in 1898 over 200 mining claims were granted, mainly on the east shore of Lake Winnipeg; but the certainty of profitable wheat-growing draws away attention from the more precarious and speculative occupation of quartz mining. Iron ore occurs, as in all the provinces, and will probably be utilised at some future time. Coal, mostly of the nature of lignite, is found in the south-west of the province in the Souris River district, and close to the international frontier; but the deposits in Assiniboia have as yet attracted more attention, and are not much farther from Winnipeg. It is

* Winnipeg newspapers of August 31, 1897.

estimated that the lignite-yielding area in Manitoba measures 15,000 square miles.*

Good building stone can be quarried on the shores of Lake Manitoba, though it is not as yet utilised.

For mining purposes, Manitoba is grouped along with the North-West Territories, and subject to the regulations laid down by the Dominion Government (p. 49).

Forests.—Although Manitoba is mainly a prairie province, it contains large areas of woodland. Every stream is bordered by trees, and the eastern portion, situated on the Laurentian Plateau, shares the sub-Arctic forest of the north, while the south-east was formerly very thickly wooded with aspen and other trees. The value of the timber is enhanced by the demand for building purposes in the treeless prairie region farther west, although the greater part of the supply required is brought by rail across the frontier from the State of Minnesota.

The Dominion land agents in Manitoba and the North-West Territories are Crown timber agents as well. They grant licences to cut timber (p. 50), and, as far as possible, endeavour to reduce the risk of forest fires, and to regulate or prohibit cutting in certain places, so as not to destroy the forest growth. Government encouragement is given to the planting of trees round farms on the prairie, but it has proved to be difficult to induce the settlers to work for benefits so remote as those resulting from tree planting.

Fisheries.—The fish of the north-eastern Lakes are of great value. They include the whitefish (the finest edible fish of the country), the pickerel, and many other varieties. Efforts are being made to protect these fish, and to increase their number by the establishment of hatcheries.

Agriculture.—Manitoba is essentially a farming country, and as such one of the richest in the world. In travelling westward across Canada, after more than a thousand miles of the rocky woodland of northern Ontario, where stations follow one another at intervals of an hour or more, and no cultivated land is to be seen, the contrast on entering Manitoba is very striking. A transitional belt of scrubby woodland gives place, near Winnipeg, to vast level fields of wheat, broken by frequent farms, the train stopping every twenty minutes or so at stations with some show of life in them, and the tall forms of the grain elevators where the wheat is stored form familiar landmarks as they occur singly or in groups. Passing along the line at harvest time, one sees the succession of west-bound trains laden

* *Statistical Year Book of Canada for 1897*, p. 116.

with agricultural machinery, and of east-bound trains laden with wheat or cattle from the ranges farther west. No fertilisers are as yet necessary for the deep rich clays of the Prairie Steppes, and the remarkable circumstance of a purely agricultural country rapidly developing so complete a railway system is proof of the profitable returns which farming may be made to yield. The best land nearest the railway stations is, of course, all occupied, and although farms are always to be had for purchase in such neighbourhoods, their prices are high. For instance, near Winnipeg improved land costs as much as \$25 (£5) per acre, while throughout the province unimproved land costs from \$3 to \$5 per acre. As the country suitable for agriculture is usually open and free from timber, the cost of bringing unimproved land under cultivation is relatively low. Agriculture is subject to certain drawbacks incident to the nature of prairie districts. Although the vast herds of buffalo which once wandered over the country are now extinct, the burrowing gophers remain in swarms which often do serious damage to crops; prairie fires sometimes sweep over great areas of grass when it dries into natural hay in the later summer, and it is necessary to surround houses and stackyards with a "fire-belt" of ploughed land, within which the grass is burned off. Summer frosts, too, are not of rare occurrence, and do much harm; but it has been noticed that after the soil has been for some time under cultivation the tendency to these frosts diminishes, even in the north of Manitoba and beyond its borders.

The crop of 1898 is given as follows:—

	Area under Crop.	Yield per Acre.	Total Yield.
	Acres.	Bushels.	Bushels.
Wheat, . .	1,488,232	17·01	25,313,745
Oats, . .	514,824	33·6	17,308,252
Barley, . .	158,058	27·06	4,277,927

The surface of the prairie in many parts is very dry, although the rainfall is usually sufficient for agricultural purposes, and artesian wells in most parts of the province yield a plentiful supply of water for domestic use.

Settlements and Farms.—Manitoba is a province of small farms as a rule, and settlement on farms of 160 or 320 acres is alone encouraged by the Government. Still experiments have been made by companies acquiring and cultivating immense

areas of ground in the neighbourhood of the railways. The keeping of live stock is increasing, and mixed farming becomes more common every year. Generally speaking, it may be said that one half of the area of prairie land in the province lies south of the Assiniboine River, and is entirely devoted to wheat. The other half, lying to the north of the Assiniboine, lends itself more to mixed farming, and the proportion of live stock kept there is much greater than in the south.

A constant stream of immigration flows into the province, and vast areas of Dominion lands still remain to be assigned, while recently a good deal of land that had been taken up by settlers, who failed to fulfil settlement conditions, has been resumed by Government and re-allocated as homesteads. In this way some farms have been available in the southern part of the province near the railways; but, as a rule, free grants are now only to be had in the outlying districts. As yet the farmers are much isolated from each other, except where groups like the Russian Dukhobors and Mennonites, Icelanders, Scottish crofters, and the like are settled in one neighbourhood. The northern third of the province is only just beginning to be touched by railways, and is still for the most part unsurveyed and unsettled, but where the railway reaches its farthest northerly extension, and the land has been laid out in the Lake Dauphin district, the influx of homesteaders in 1898 was actually in excess of the capacity of the surveyed lands, and the laying out of new townships was proceeding as rapidly as possible.

Still farther north, in the Swan River district, beyond the railway, a great company of the Russian religious sect known as Dukhobors (8000 in all) were settled in 1898 and 1899.

The method of disposing of the Dominion lands is the same for Manitoba and the territories and has been described on p. 49. In Manitoba about 1400 homesteads were granted in 1898.

While Manitoba has rich soil, and vast areas of it, specially suited for the growth of wheat, not every homesteader who takes up a quarter section prospers. Some experience and much hard work are necessary if a man is to reap advantage of the good natural conditions. But no one bringing these to bear will be disappointed of a comfortable living, which, if rough at first, can gradually be surrounded with much solid comfort. Every effort is made by the Government agents to give settlers an opportunity of making the most of their farms. Rights to cut timber and hay on adjoining unoccupied lands are given either free, if for the use of the farmer, or at a small charge if for sale; the experimental farms supply samples for new

crops, and give advice gratuitously on many subjects; the Dominion Government is always ready to support railway extension, and the great wheat dealers, following the growing lines, establish their elevators, at which grain is purchased or received on deposit at almost every station. Stress has been laid by a recent *Times* correspondent (Miss Shaw) on the importance of encouraging young women from the United Kingdom to settle in Manitoba and the adjoining territories along with their brothers, thus preserving traditions of home life.

THE ORGANISED DISTRICTS.

North-West Territories.—The North-West Territories comprise the whole of western Canada between Manitoba, Hudson Bay, and British Columbia. They are more directly under the control of the Dominion Government, and enjoy less complete home rule than the provinces. As far as regards police, the survey and sale of lands, and the utilisation of resources, the North-West Territories and Manitoba are classed together; but the greater part of the region is still practically an unknown land, and is to be distinguished from the southern portions, which are well known, fairly settled, and rapidly developing. The three southern divisions are known as the Organised Districts of Assiniboia, Saskatchewan, and Alberta, and each is a province in the making. Meanwhile they are associated—together with Athabasca, which lies north of them—for the purposes of local government, under a lieutenant-governor, with an elected parliament meeting at Regina, and representation—though not to the same numerical extent as a province—in the Dominion Parliament.

Assiniboia, Saskatchewan, and Alberta.—Alberta is bounded on the west by the crest of the Rocky Mountains, and on the east by the meridian of 111° W., and reaches from 49° on the United States frontier to the parallel of 55° , which bounds it on the north. Assiniboia runs along the international frontier, between Alberta and Manitoba, and is separated from Saskatchewan to the north of it by the parallel of 52° . From the mountains the Athabasca, Pembina, and North Saskatchewan Rivers flow north-eastward across Alberta, the Bow, the Belly, and the Red Deer Rivers flow south-eastwards to form the South Saskatchewan, which, turning north-eastward across Assiniboia, unites with the North Saskatchewan in the district of Saskatchewan, and flows into the north end of Lake Winnipeg. The escarpment of the Cypress Hills runs from west to east through

Southern Assiniboia, and the Qu'appelle and Souris Rivers run thence eastward to join the Assiniboia in Manitoba. The north-eastern corner of Saskatchewan lies on the Laurentian Plateau; the rest of the districts continues the gradual rise from Manitoba to the Rocky Mountains, with an average slope of $5\frac{1}{2}$ feet to the mile. The low line of moraine hills, called the Missouri Coteau, marks the transition from the second to the third, or highest prairie steppe. The western part of the districts is underlain by Cretaceous rocks, usually deeply covered with glacial drift, but often yielding valuable minerals, including coal.

The general surface of the plains is that of a grassy prairie, like western Manitoba, stretching in monotonous apparently level tracts, but rising here and there into hills and ridges, while the rivers have cut for themselves deep valleys. In these valleys and on the hills there are trees, but it is estimated that over 190,000 square miles (including part of Manitoba) is treeless prairie. In the north the sub-Arctic forest begins with park-like land, containing isolated clumps of trees, which thicken in the district of Athabasca in the north, into continuous woodland, covered with forests of spruce and larch.

Climate.—The climate is severe; the summers are hot and the winters very cold, while the air is always dry and the rainfall slight, although increasing somewhat towards the east. The prevalence of the Chinook wind descending dry and warm from the summit of the Rocky Mountains, mitigates the severity of the winter to such a degree that cattle may remain outside without shelter, and in many places the layer of light powdery snow is so thin that cattle can reach the natural hay with which the prairies are covered. The rainfall is slight, and, especially in the western districts, insufficient for agriculture. The annual fall is between 6 and 12 inches. Although the Chinook wind makes the southern territories milder than Manitoba in winter, it has also the effect of producing great and sudden changes of temperature, causing occasional thaws in the coldest months. It is said that a range of 60° in temperature has been experienced within twenty-four hours.

Communications.—The resources of the Organised Districts are more varied than those of Manitoba, and the land much less settled. Agriculture is relatively less important, while ranching and mining are already more developed and promise great things for the future. At present the vast resources are scarcely touched; they require increased population and improved means of communication before they can be utilised, and,

although population is steadily coming in, and railways are steadily pushing their termini farther and farther into the more remote corners, generations must elapse before the country can achieve its full development.

The first and chief line of communication is the Canadian Pacific Railway, through Assiniboia and Alberta, on which a series of small but prosperous and progressive towns have grown up. Regina, the capital of the Territories, is situated 357 miles west of Winnipeg, and nearly 1900 feet above the sea. A branch line runs thence northward to Prince Albert on the North Saskatchewan river not far from its confluence with the South branch, both of which are navigated in summer by steamers. The Manitoba and North-Western Railway from Winnipeg and Brandon crosses the north-eastern angle of Assiniboia, and is being extended to Prince Albert in Saskatchewan. At Pasqua, a few miles farther west on the C.P.R., a direct line from the south-east brings passengers from Minneapolis and the central parts of the United States. This line passes through Estevan in the south-east of Assiniboia, a mineral centre connected with the Manitoba railway system. Dunmore, 653 miles west of Winnipeg, and about 2000 feet above the sea, is the station where the important branch runs due west to the mining centre of Lethbridge in Alberta, and on to cross the Rocky Mountains by the Crow Nest Pass to the Kootenay district. The main line, turning north-westward, enters Alberta, and ascends the slope of the plains to the fine, stone-built town of Calgary (3400 feet), 840 miles west of Winnipeg. Here one important branch, on which a train runs twice a week, goes north 192 miles to Edmonton, on the navigable North Saskatchewan, and another goes south to Fort Macleod, just west of Lethbridge, and from Lethbridge a line runs into the United States. The district of Athabasca farther north is not yet touched by railway, and can be reached most easily by boat journeys with several portages from Edmonton. The construction of a railway north-westwards to the Yukon Territory has been spoken of as of importance for the development of the extreme north-west.

Laws.—The North-West Territories maintain a special armed force of 800 men, the North-West Mounted Police, a fine body of cavalry with headquarters at Regina, but usually scattered in small bodies over the territories, looking after the Indians and keeping order generally. It is not too much to say that no part of the world equally remote from centres of government, and containing considerable numbers of an aboriginal race in contact

with white settlers, is so peaceful and well-ordered as these territories. The native Indians in all parts of western Canada are well disposed and trustworthy when kept from drink, and many of them have settled down to agricultural work. Most of them, however, are engaged in hunting and trapping for the Hudson Bay Company. Although now without administrative rights this company is still the great power in the territories. The Hudson Bay Stores, while no longer possessing a monopoly of trade, maintain the lead in all the towns by their large stock and fine premises; while, beyond the railways, the only organised means of transport are their steamers or boats on the rivers, and the only representatives of civilisation their trading posts for buying furs from the Indians.

The restrictive laws are, as a rule, the same as for Manitoba. The sale of drink to any one under 18, or tobacco to any one under 16, is prohibited, and the employment of barmaids is forbidden, the only women allowed to sell drink being licence-holders or the wives of licence-holders. How far these regulations are enforced it is not easy to say.

Forests.—The North-West Territories are not likely ever to yield timber for export, but in the sub-Arctic forest in the north, on the slopes of the Rocky Mountains, on the hills in the south, and in the river-valleys everywhere, there are valuable woods, and sawmills for the supply of local needs can be worked profitably. The value of the forests is as yet, however, quite insignificant as compared with that of the open prairie land. The regulations regarding timber-cutting are those which apply also to Manitoba, mentioned on p. 50.

Minerals.—The known mineral resources of the territories are sufficient to lead one to expect that much has yet to be discovered, especially in Athabasca, where very little exploration and practically no prospecting has yet been done. Whoever proposes to explore these regions must rely much on himself. He must be content with the society of the few Indians and half-breeds who navigate his canoes, must live on the unvarying bacon and beans of the typical Canadian prospector (except when game or fish can be procured), must become inured to the heat and mosquitoes of summer and the intense cold of winter, with inadequate shelter. But in return he will have the satisfaction of being a pioneer in a really new land where anything in the way of discovery of economic resources is possible.

Gold occurs in the gravels of many of the rivers flowing from the Rocky Mountains, and it is probable that auriferous quartz

veins also exist in these mountains or along the course of tributaries, from which the alluvial supply is derived. The Huronian formation has come to be recognised as the richest gold-bearing rock system in Canada, and the origin of the auriferous gravels of the Saskatchewan and other rivers is assigned by the Geological Survey to the great Laurentian Shield, the mass of ancient rocks surrounding Hudson Bay. About \$50,000 worth of gold is annually obtained from the North Saskatchewan, near Edmonton, the richest stretch of the river being the 60 miles above and the 60 miles below the town. The method employed is by dredging the gravel from the river-bed and washing it on board the dredging vessel which is moored in the stream, licences being given by the Government covering so many miles of river. A bad year for farming drives many settlers to gold-dredging, but a good harvest tempts them away to the more certain profits of the farm.

The North-West Territories contain an immense area of coal-bearing strata of Cretaceous age, the quality of the coal ranging from the lignite of the Manitoba frontier to the bituminous coal of Lethbridge, and to anthracite at some points in the Rocky Mountains. It is estimated that 60,000 square miles in Alberta, Saskatchewan, and Assiniboia are coal-bearing. The annual production is about 200,000 tons, most of which is raised at Lethbridge. The existence of coal at Lethbridge and other points nearer the Rocky Mountains was, indeed, the controlling reason for constructing the railway through the Crow Nest Pass into the Kootenay gold and silver mining district, and had its value been known earlier there is little doubt that this route would have been chosen for the main line of the C.P.R. The Souris River lignite is being increasingly worked at Estevan and other points in Assiniboia. Coal is mined on a smaller scale near Edmonton, Calgary, at Banff in the middle of the Rocky Mountains, and at Cochrane in Bow Pass, where anthracite is worked. Coal-mining is bound to develop, and accessible seams near the towns or at points convenient for ready transport will become very valuable.

Petroleum of rather poor quality occurs in large quantities near the Saskatchewan River. Experimental borings at Victoria, near Edmonton, and elsewhere have as yet failed to yield a commercial supply, but there is every prospect of paying oil wells being found. The trial borings at Victoria, near Edmonton, and at points on the Athabasca River, in the north-east of Alberta, were stopped by the immense quantities of natural gas liberated. This gas field is probably very extensive, and promises to be

important for manufacturing purposes when the district is more developed.

Mining Laws of Manitoba and the Territories.—For Manitoba and the Territories—not including Yukon, for which separate regulations are in force—mining is subject to the following conditions, which are under the control of the Minister of the Interior of the Dominion Government:—

A fee of \$10 is charged for a permit to prospect for coal over an area of 320 acres for sixty days. Coal lands are sold at the rate of \$20 per acre for anthracite lands and \$10 per acre for other coal, but no applicant is allowed more than 320 acres. For minerals other than coal, iron, and mica the maximum size of a mining location is 1500 feet by 1500 feet.

A free miner's licence is granted to any individual over eighteen years of age at the rate of \$10 per annum. A joint-stock company may obtain a similar licence for \$50 if the nominal capital of the company does not exceed \$100,000, for companies with larger capital the charge is \$100. The free miner's certificate is not transferable, and gives to the holder alone a right to enter, locate, prospect, and mine on any vacant and non-reserved Dominion lands, except in British Columbia, and to shoot, fish, and cut timber for his actual necessities. On locating a claim the free miner must stake it out, and record it with the Mining Recorder within fifteen days, if the claim is not more than 10 miles from the Recorder's office, an additional day being allowed for every 10 miles. Once registered, a claim may be held as long as the miner pleases to work on it to the value of \$100 a year, or pays that sum to the Mining Recorder. The free miner may obtain a Crown grant of the location by paying a sum of \$500 in lieu of expenditure on the claim and \$5 per acre as purchase money.

Farming and Ranching.—The nature of the farming carried on in these territories varies according to the climate, and especially the rainfall. Wheat-growing predominates along the Canadian Pacific Railway from Manitoba as far as Regina, west of which mixed farming is more practised, and on the dry plains leading up to the foot-hills of the Rocky Mountains, in Alberta, ranching practically monopolises the attention of the settlers. The land is being surveyed into townships and sections for settlement by purchase or free grant as homesteads under the Dominion Government, according to the system described at p. 49. This holds good as yet only for parts of Assiniboia, Saskatchewan, and Alberta, although in time it will be extended to the best parts of the northern territories. But experience

has shown that in the sub-arid belt, in the west of the Third Prairie Steppe, the absolute ownership of a small holding is not the most economical or satisfactory method. Accordingly, in southern Alberta and western Assiniboia, the large herds of cattle are kept on grazing leases, covering a great extent of open country, and managed to a large extent on co-operative principles. The cattle are left free to roam over hundreds of square miles of country, and only collected twice a year, the herds being managed by mounted cowboys, in the proportion of one man to about 500 cattle. The conditions of healthy life for cattle in respect to climate and herbage, are, in fact, nearly the same as those which governed the native herds of buffalo. This kind of stock keeping, of course, applies only to the breeding of cattle for export as live stock or as beef. For dairy-farming enclosures are necessary; but the dairy-farming districts lie in the eastern divisions, leaving the west as a land of ranches. The wooded districts of northern Alberta and Saskatchewan, where rainfall is greater and snow deeper, necessitating shelter and food for cattle in winter, are better adapted for mixed farming, and some of the best agricultural land and the best breeds of cattle are found round Edmonton and Prince Albert.

To ensure successful and profitable ranching on the sub-arid steppes it is necessary to have a considerable acreage per head of live stock, to have large herds and few cowboys, and to arrive at an understanding by which strayed cattle may be recovered, even if found beyond the limits of the districts or of the country. To secure these advantages the ranchers of Alberta and the other districts have formed a voluntary organisation, the members of which work the herds together, although the live stock remains the individual property of the owners. Thus the owner of 2000 cattle takes part in the annual "round-up," bringing, say, three cowboys, the owner of 200 cattle comes alone, the owner of half a dozen probably acts as a cowboy to one of the wealthier ranchers, and takes the opportunity of branding the calves of his own cows as he meets them. The only guide to the property in calves is the brand on the cow with which they are running. Such an organisation is not one to lead ultimately to a dense population. When the wealthier owners add to their herds, until what they believe to be the limit of the grazing capacity of the country is reached, they will naturally admit no new settlers into the organisation, and so close the country to farther development. Until the time comes when the profits will be greater by holding a monopoly than by encouraging an

increase of herds, the method will doubtless work to the benefit of the community; but there is a danger in a purely pastoral region of the land becoming prematurely closed to newcomers. From this fate the mineral resources of the territories will probably save them.

The herds set free on the plains are usually in the proportion of six bulls to 100 breeding cows. Hay has to be provided to feed the weaklings in winter; the strong cattle require, however, neither shelter nor attention. The first "round-up" of the year takes place in June, when the calves are branded; the second in autumn, when the cattle selected for beef are captured, and sent off by rail to the markets in the mining districts of British Columbia, or eastward to Montreal for ultimate shipment to Europe.

Irrigation.—In the best ranching country of Alberta attempts to grow grain have never been successful; the remarkable dryness of the air prevents the grain from ripening. Recently, however, irrigation has been resorted to with marked success. At the close of 1898 there were 177 irrigation ditches in operation in southern Alberta and western Assiniboia, with a total length of 409 miles, and capable of irrigating 103,400 acres. The irrigation works near Calgary, M'Leod, and Lethbridge have been very successful. So promising was the preliminary work, that the Dominion Government ordered a special irrigation survey of the whole eastern slope of the Rocky Mountains and the foot-hills in Alberta, a work which is being carried on energetically. Its purpose is to ascertain the available supply of water in the rivers flowing from the Rocky Mountains, the best sites for storage reservoirs in the sub-arid regions, and the most advantageous lines for canals to bring river water to the reservoirs. It is estimated that about 6,000,000 acres of sub-arid land, or about one-tenth of the whole, may be successfully irrigated, and turned from pasture to very rich agricultural land.

Future Development.—By the proportionate development of all their natural resources, Assiniboia, Alberta, and the scarcely touched Saskatchewan territories will one day undoubtedly become great self-supporting provinces, providing for a population of many millions. As the pressure of the population on the means of subsistence begins to be felt, the less inviting northern territories of Athabasca and Mackenzie will also be gradually settled, less densely, doubtless, but yet under conditions no worse than those of many prosperous communities in the Russian Empire.

The actual areas of available land have been stated as follows :—

AREA OF THE NORTH-WEST TERRITORIES (PROBABLY 1897).*

I. Area of districts of Alberta, Assiniboia, Saskatchewan, and Athabasca (approx.),		Acres.
		345,000,000
		Acres.
Area reserved for railways,	.	55,234,880
„ of Indian reserves,	.	2,337,908
„ of school endowment,	.	19,200,000
„ of timber reserves,	.	573,440
„ of Hudson Bay Company ($\frac{1}{10}$ of the fertile belt),	.	5,800,000
„ Disposed of as homesteads, sales, &c.,	.	4,453,772
Total area disposed of,	.	87,600,000
Leaving area available for settlement, sale, &c.,		257,400,000
II. Areas in which no land has been disposed of—		
Area of Mackenzie District (approx.),	.	313,600,000
„ Keewatin „ „	.	294,400,000

Of these immense areas, however, a great deal could never be settled, and a great deal more could never yield more than a hard and scanty subsistence to its inhabitants; but it is not excessive to estimate the population which the western territories are capable of supporting comfortably as 25,000,000, or five times the present population of the whole Dominion. Indeed, good judges of the capacity of the country consider that the prairie regions alone may support 100,000,000.

REMOTE TERRITORIES.

Athabasca.—The district of Athabasca, north of Alberta and Saskatchewan, is at present beyond the limits of survey and settlement, but it may be expected in the future to develop at least sufficient agriculture to support the miners which its undoubted mineral wealth will attract. About 600 miles of the lower Peace River valley are reported to be rich agricultural land, and the valley may be taken as 50 miles wide. Wheat and cattle are raised by the few settlers near the centres of river traffic, Fort Vermilion and Dunvegan; and the climate is said to be no more severe than that of Manitoba. The Pine River Pass, leading through the Rocky Mountains to British

* From *Canada: an Encyclopædia*, Toronto (not dated, but probably 1898), vol. v., p. 67.

Columbia, is an easy one, which would offer little difficulties to the construction of a road or railway.

Mackenzie, Keewatin, and Ungava.—These districts occupy the lands surrounding Hudson Bay and the Arctic Sea. They are still very imperfectly explored; but enough is known of their soil and climate to prove that any great future development must depend on mineral wealth alone. At present they are merely hunting grounds for the fur traders of the Hudson Bay Company, although gold prospectors are paying more and more attention to the river gravels. The possible extinction of the beaver and other of the finer fur-bearing animals suggests that the time may be approaching when fur farms will have to be established, like the feather farms of ostriches in South Africa. The life-habits of the valuable fur-bearers should be carefully studied, in order to find which kinds could be preserved together, and protected from their natural enemies, perhaps by enclosing very large tracts of country. The rivers and lakes in summer offer good means of communication, considering the remoteness of the region, and in boats or canoes the region may be easily traversed from south to north, or from east to west in a single summer. Steamers belonging to the Hudson Bay Company run on the Athabasca, Peace, and Mackenzie Rivers during the navigable months, and the delta of the Mackenzie can be reached by sea through Bering Strait in summer. Athabasca and Keewatin and the southern part of Ungava are almost all covered by the great sub-Arctic forest, which also covers the Mackenzie Valley up to the Arctic circle. The eastern part of Mackenzie, however, belongs to the Barren Grounds, a desolate region, with a little stunted wood in parts, but mostly covered by moss and swamps, like the Siberian tundra. The climate in these districts is extremely severe, the summers short, hot, and rendered wretched by mosquitoes, the winters very long and cold. Yet grain has been experimentally grown and ripened far north in the Mackenzie Valley, and the posts of the Hudson Bay Company have gardens yielding a great variety of excellent vegetables, even where the ground remains permanently frozen at the depth of 6 feet or so. Good agricultural land is reported on the Liard River, which flows through north-eastern British Columbia to the Mackenzie. The conditions of life there are perfectly tolerable to hardy settlers.

Reported Mineral Wealth.—The mineral resources of these districts have only been tested in isolated places. Inexhaustible quantities of the richest iron ore (magnetite and hematite) are

known to exist in Ungava, and the forests and peat of the Labrador peninsula might supply fuel capable of smelting it if transport could be provided.

Gold occurs in the Huronian rocks everywhere throughout the districts, and gold-mining will doubtless be prosecuted on a large scale in the course of time. Prospectors have found some alluvial gold on the Athabasca and Peace Rivers, and the excitement consequent on the great gold discoveries in the Yukon district led a number of prospectors and would-be miners to make the long journey from Edmonton by the Athabasca and Mackenzie Rivers, down which they travelled seeking an easy route westward to the Yukon Valley. On the way a good deal of prospecting was done, and, although no very definite reports have yet been received, it would appear that there is a vast area of rich mineral land extending from Great Slave Lake in 61° N. on by Great Bear Lake to the Arctic Sea.* It is suggested that that this region may, if the deposits prove paying, be reached by steamers from the Arctic Sea ascending the Mackenzie River. The mouth of the river is accessible from Bering Strait, and whalers have repeatedly wintered in the vicinity, but we are not aware that any vessel has attempted to find a navigable channel into the river from the sea.

Lignite occurs on the Peace River, the Liard, and in the Mackenzie Basin, where, near Fort Norman, lignite beds were discovered on fire by Sir A. Mackenzie on his great exploring journey in 1788, and for several miles these beds are still burning. The importance of a supply of natural fuel in a region of intense winter cold and great mineral wealth need not be insisted on.

THE YUKON TERRITORY.

Position.—The discovery of alluvial gold in exceptionally large quantities in the valleys of the Klondike River and Bonanza Creek in 1897 led to a "rush" of miners from all parts of the world to the upper Yukon Valley. From, perhaps, one hundred individuals the population has, in two years, risen to considerably over 30,000. Consequently, the Yukon District has been separated from the North-West Territories, of which it formed part, and has been given a separate administrative organisation under the Dominion Government. Lying north of British Columbia and west of Mackenzie, the Yukon District is

* *Annual Report of the Department of the Interior for 1898.* Ottawa, 1899, p. 34.

bounded by the United States Territory of Alaska on the west, the boundary line being the meridian of 141° W., but in the south-west a portion of the boundary was undefined and has been a cause of serious difficulty. The coast strip of Alaska cuts off the interior from the sea; and as it is not decided whether the "coast" from which the 30-mile strip is to be measured is the general coast line on the ocean or the actual contour of every inlet, a temporary understanding has been come to which leaves the seaports in United States territory and makes a provisional boundary at the watershed.

Yukon River System.—The district had been geologically explored by Dr. G. M. Dawson, Director of the Canadian Geological Survey, some years before the "rush" took place. Thus the general outlines of the river system were well understood in advance, and the Dominion Land Survey promptly sent up a surveyor, Mr. Ogilvie, to fix and mark the position of the boundary meridian where it crosses the rivers so that no new international difficulties should arise. The following account of the geography of the Yukon District and the routes leading to it is mainly taken from Mr. Ogilvie's reports* and from the more recent publications of the land and geological surveyors, both of which have been engaged on the district every summer. Some facts have also been supplied to the author by Mr. J. B. Tyrrell, of Dawson, formerly one of the geological surveyors.

The Yukon River is formed by the junction of two main branches, the Pelly and the Lewes, which come from the south-east and meet at a point nearly in 63° N. and 137° W. Each is formed by the convergence of a number of important tributaries. The Pelly has a length of about 320 miles from its source to the confluence, and it rises near the head waters of the Liard River, which offers a means of communication with the east of British Columbia and the Mackenzie Valley. The Lewes has two main branches; the Teslin, or Hootalinqua, flows from the long narrow Teslin Lake on the southern border of Yukon District, and lake and river together have a length of 200 miles of navigable water to the confluence with the Lewes proper. The Lewes comes from a series of lakes, Atlin, Tagish, and Bennett, farther west, less than 30 miles from the Pacific, and flows for 187 miles to the confluence with the Teslin. This course comprises some fairly wide lakes, and is broken about half-way by two serious obstacles to navigation—Miles Canyon, where the stream is narrow and the current very rapid, and the White-

* Summarised in his paper in the *Geographical Journal*, vol. xii., 1898, p. 21.

horse Rapids, the passage of which downstream in boats has led to many fatalities. From the junction with the Teslin to the mouth of the Pelly is a distance of 169 miles, which includes the Five Finger Rapid, not a serious obstacle, and a farther distance of 175 miles of clear river navigation leads to Dawson (formerly called Dawson City), the largest mining camp ever known in Canada. Thus from the head of Lake Bennett to Dawson is a distance of 531 miles navigable downstream by boats, but with two obstacles which steamers could not pass; and from the head of Teslin Lake to Dawson is 544 miles of free navigation adapted for river steamers both up and down. The Pelly River receives an important tributary, the Macmillan, from the east; and the Lewes receives the Big Salmon River on the right bank from the south-east, and the Nordenskiöld River on the left bank from the south. The united Yukon, about 100 miles below the confluence of the Lewes and Pelly, receives Stewart River from the east and White River from the south-west. Sixty-Mile River comes in from the west lower down, and the short Klondike River enters from the east close to Dawson. From Dawson to the frontier is a distance of 90 miles down the Yukon, the most important tributary being the Forty-Mile River, coming in from the west. The Porcupine River runs north through an almost unknown part of the district, and may be easily reached from the delta of the Mackenzie in $67\frac{1}{2}^{\circ}$ N. There it turns round, crosses the frontier, and enters the Yukon River at Fort Yukon. From Dawson to the mouth of the Yukon in Bering Sea is a distance of 1577 miles, all navigable for light-draught steamers in summer (see Map, Fig. 4, p. 147).

The country is as a whole mountainous, or at least elevated, the valleys of the smaller rivers being deep and narrow, and those of the larger rivers wide and gently sloped; but above the valleys, which are heavily timbered, there are bare uplands so smooth and level that roads can be easily constructed from point to point. Along all the rivers there is a plentiful forest growth changing into low scrub on the hills.

Climate.—The climate is sub-Arctic, the soil permanently frozen from a foot or two below the surface to a depth of about 200 feet, and the thawing of the surface in summer gives rise to marshes on all the low ground. The summer is short and hot, and in the northern part of the district the sun does not set at midsummer for several days, while mosquitoes are a terrible plague. Near Dawson, however, little or no trouble is experienced from these insects. The winters are long, and about as cold as in any part of the world; the rivers are frozen for several

months, and snow lies thickly. Still, once good houses have been built, the cold is no drawback to a comfortable life, even although in mid-winter the period of daylight is restricted to a few hours. Those who have had experience of the winter in all parts of Canada consider that Dawson is no worse to live in as far as climate is concerned than Winnipeg or even Ottawa, the spring being equally early, while a great variety of wild flowers appear as soon as the snow departs. Mr. Ogilvie gives observations of temperature, from which the following figures are selected from the records of five incomplete years :—

Month.	Maximum Temperature Reading.	Minimum Temperature Reading.	Month.	Maximum Temperature Reading.	Minimum Temperature Reading.
	Degrees.	Degrees.		Degrees.	Degrees.
January, .	13	- 67·9	July, . .	81	33
February, .	32	- 64·8	August, .	76	21·6
March, . .	39·5	- 54·3	September, .	63	4·8
April, . .	49	- 37·7	October, .	51	- 12·7
May, . .	62	- 1·8	November, .	38·5	- 36·3
June, . .	80	27·8	December, .	11	- 55·4

From November to March the temperature usually falls below zero every night, and from December to February it is rare for the mercury to rise above zero at any part of the day.

Resources.—Wild berries ripen under the long Arctic sunshine, and small quantities of vegetables have been raised in gardens by exercising great precautions; lettuce is said to thrive best. Doubtless a great deal could be done by growing vegetables under glass, and as long as the great population of gold-seekers remains in the Yukon Valley it would pay a hardy market gardener to try the cultivation of vegetables under artificial shelter, which would probably bring him in a larger income than gold-mining.

Mineral products other than gold abound. Excellent silver-bearing lead has been found at Forty-Mile River, the silver averaging 34 ounces per ton in some samples examined. Native copper has been brought in by Indians, and great supplies could probably be found if sought for. What is more important is that coal occurs in large quantities, chiefly in the form of lignite, and often in the banks of the streams in the most favourable position for mining.

Routes to Klondike.—As Dawson on the Yukon, near the mouth of the Klondike River, has been made practically the one

centre and emporium of the Canadian Yukon, it forms the headquarters whence explorers and prospectors must start, and to which newcomers must make their way in the first instance. The routes leading overland from Edmonton by the Mackenzie River and its western tributaries are quite impracticable except for men who wish to prospect on the way. The transport of supplies is practically impossible, until railways, or at least wagon roads, are built to connect with steamers on the navigable waterways. The same is true for land routes through the interior of British Columbia. The route which at first sight is most attractive is by steamer up the Yukon River from its mouth, but this is slow and troublesome. Though the river becomes navigable in May, the sea ice does not clear away from the mouth of the delta until July, and the stream begins to freeze in the middle of October, so that barely three and a half months are available for the traffic. Sometimes it is said that the navigable season scarcely exceeds six weeks. St. Michael, the nearest port for transhipping to river steamers is 3000 miles from Victoria, B.C., or from Seattle, whence supplies are sent, and is separated from the actual mouth by 70 miles of sea, across which river steamers can only venture in fine weather. The cost of freight delivered in Dawson by this route is from \$125 to \$130 (say £25) per ton, and the time required from St. Michael to Dawson is from sixteen to twenty days, if no serious stoppage occurs.

The most practicable routes at present are from west coast ports to the upper navigable waters of the Lewes and down that river in boats. Only three of the many which have been traversed need be referred to here. The first of these, by the Stikine River, has the advantage of passing entirely through Canadian territory, thus avoiding any custom-house. The mouth of the Stikine is in the Alaska coast-strip, and the transfer from the ocean steamer to a river steamer must either be made at Fort Wrangell, subject to transit dues, or else at Fort Simpson, in British territory, 170 miles further south, in which case the ocean swell in crossing Dixon entrance, 40 miles wide, may prove dangerous. The Stikine is navigable for 150 miles to Telegraph Creek,* and from this point it is 150 miles across comparatively easy country to Teslin Lake, whence there is river navigation direct to Dawson, subject, however, to detention by several shallow bars. If a railway were built for this distance the route would possess

* There is no telegraph; the name commemorates the surveys for a land line from Europe to America *via* Siberia, with a cable across Bering Strait, before the possibility of an Atlantic cable was realised.

certain advantages, but the Upper House of the Dominion Parliament threw out the bill for such a railway in the autumn of 1898, and it was not proceeded with.

The most direct route is from the head of the Lynn Canal from Dyea up to the Chilkat River, along which a trail or pack road has been cut which leads to the Nordenskiöld River, by which the Yukon may be reached, 240 miles above Dawson. This route is known as the Dalton trail, from the constructor of the road. It traverses a rich but as yet untouched mineral country.

The route now in favour is from Skagway at the head of the Lynn Canal, whence a railway has been built over the White Pass, crossing the Coast Range to Lake Bennett, a total distance of 48 miles. There is a United States Custom House to be passed at Skagway. That port is four days by ocean steamer from Victoria or Vancouver, and Lake Bennett is three days by river steamer to Dawson, the period of navigation being from June to September. The Skagway route will hold a practical monopoly until other railways are constructed.

Conditions of Life in the Klondike Region.—It is estimated that from £2,000,000 to £5,000,000 worth of alluvial gold was taken out of the Yukon district in 1898, and no less in 1899.* An equal amount may be obtained annually for many years without exhausting the supply. The Commissioner of Yukon District estimated in 1898 that for 25 years to come the goldfields would attract and hold a large population.† The whole country is auriferous, although prospecting is seriously retarded by difficulties of transport and the immense cost of all supplies. The gold is not found on the surface, but, on the Klondike and its tributary creeks, is covered, first by a layer of soil a few feet thick, and then by a bed of gravel from 10 to 20 feet thick, the lower layers of which, resting on the bedrock, contain large quantities of gold dust and nuggets, sometimes of considerable size. Hence the conditions of mining are arduous, and the cost of freight makes it impracticable to employ heavy machinery. The usual method of working is to sink shafts in winter through the frozen gravel to the bedrock, and to tunnel along the rock, hoisting up the "pay-dirt" which is stacked on the surface till summer. Great fires have to be lighted in the shaft to thaw the frozen soil sufficiently to allow it to be dug out, and in summer, when it softens, the pits fall in. The

* The figures officially published probably considerably understate the amount of gold produced. They were approximately £2,000,000 in 1898, and £3,200,000 in 1899.

† *Annual Report of Department of the Interior for 1898.*

summer is occupied in washing out the gold. Another method is employed which, however, is practicable only in summer. It consists of stripping off soil and gravel, and then washing the whole of the "pay-dirt" which lies on the bedrock. Experts believe that many other creeks in the Yukon basin will yield as rich returns as the Klondike if they are fairly tested. The only difficulties in the way of doing this are the expense of provisions and of hired labour. In 1898 £2 per day was ordinary pay for shovelling gravel; in 1897 the day's wage was £4, and cases are recorded where many thousand pounds worth of gold have been obtained at a loss. These enormous wages did not mean great gains to the earners, for in those years the cost of living was very high, and supplies very scanty. All the alluvial claims in the neighbourhood of Dawson have been taken up long ago, and newcomers must first find, then stake out, and register their claim before they set to work upon it; or, which is more likely to be profitable, they must buy a claim from some one who is "going out."

So far hydraulic mining has not been attempted, although it will doubtless soon be introduced. Dredging the river bars has also yet to be commenced. When it is possible to introduce machinery, quartz mining will probably be undertaken, although as yet the quartz veins have not been seriously sought for. Auriferous rock is known to exist at Cone Hill near the town of Forty Mile, averaging about 24s. of gold per ton, while other exposures have been found opposite Dawson and in the Klondike Valley, yielding a much higher assay. The extent of the rock cannot be determined at present, but is believed to be enormous.

The hardships of the pioneers who located and first worked the gold at Klondike, will have to be repeated by any prospectors who hope to open up new regions of great richness, and it is probable that fortunes will be made more rapidly by the numerous traders and caterers who wait upon the wants and amusements of the miners, than by the men who actually extract the gold. Miss Shaw, the special correspondent of *The Times*, came to the conclusion, as the result of enquiries on the spot, that only 4000, or at most 5000, men were actually engaged in mining in 1898, the other 20,000 to 25,000 being either idle or occupied in trade. The conditions of mining also are onerous on account of the heavy government royalties which cut down the margin of profit. Dawson, like all sudden agglomerations of population, is not a healthy town. Scurvy and typhoid fever are common and the death rate is high. On the other hand,

although there are liquor shops and gambling saloons in abundance, and much extravagance and recklessness, law is respected and property is safe. A telegraph line has been laid from Skagway to Dawson, and banks have been established through which the thrifty miner may remit his gold to the outer world by paying a handsome percentage. There is a regulation that no one shall enter the district unless he brings two months' provisions and £100 in cash, or six months' provisions and £40, a condition made necessary by the sufferings of the early gold-seekers, who, in many cases, were almost without resources.

The Commissioner of the District was of opinion that not more than one quarter of the population on the goldfields were British subjects in 1898; the great majority were Americans from the United States, but almost every nationality was represented. The sudden rise of the Nome diggings in Alaska, in 1899, is expected to cause a movement from Dawson to the newer goldfield.

Mining Regulations.—The free miners' licence, costing \$10 a year, as in the other territories, is necessary for all prospecting and mining. Creek and gulch claims (*i.e.*, claims in the narrow valleys) are 250 feet in length, measured along the stream, and extend to the sides of the valley, if these are not farther than 1000 feet from the centre. River claims are also 250 feet long, but apply to one side of the river only; and placer claims on the hill sides or on benches (raised river terraces) are 250 feet square. In all new allotments every alternate ten claims are reserved by the Government. A fee of \$15 per annum is charged for each claim, and a royalty of 10 per cent. of the gold produced, is payable if the total annual output exceeds \$2500. Hydraulic mining claims are put up to auction, and an annual rental of \$150 is also payable, while at least \$5000 per annum must be spent on the work. Quartz mining claims are subject to the same conditions as in the North-West Territories (see p. 88).

THE PROVINCE OF BRITISH COLUMBIA.

Position and Surface.—British Columbia is the largest and most western of the provinces. Facing the Pacific Ocean, and shut out from the eastern provinces by a double chain of lofty mountains, it has developed independently, and retains, around the capital at least, more resemblance to the Mother Country in ways of life than any other province in the Dominion. Separated from the North-West Territories by the eastern ridge of the

Rocky Mountains, as far as 55° N., and then by the meridian of 120° W., from the United States by the parallel of 49° N. on the south, and from Yukon by the parallel of 60° in the north, British Columbia is bounded by the ocean on the west as far north as Dixon Entrance, beyond which the coast strip of Alaska occupies the west. The coast is deeply indented with fjords, running up amongst the mountains of the coast ranges, like the fjords of Norway or of the South Island of New Zealand, and a chain of hilly islands runs parallel to the general trend of the coast, the largest being Vancouver Island, the nucleus of colonisation and the site of the capital. Between the roughly parallel mountain systems of the Rocky Mountains and the Coast Range, each of considerable breadth, there is an irregular interior plateau, for the most part cut up into deep valleys, and containing some fairly high mountains.

River System.—The river system is complicated. In the extreme north-east the Liard River flows to the Mackenzie, and in 56° N. the Peace River, belonging to the same system, also runs eastward. South of 56° the chief rivers flow in curiously curved courses through great valleys parallel to the Rockies and the Coast Range. The Fraser River, rising in the Yellowhead Pass in the Rocky Mountains, runs north-west to about 54° N., where it bends southward round the Cariboo Mountains, receiving the drainage of many lakes from the north-west, and on its southward way receives the Quesnelles and Thompson Rivers from the east, and the Chilcotin, Lillooet, and other short rivers from the west; finally, the Fraser turns abruptly westward, and enters the Strait of Georgia. Farther south, in the same long valley, of which the north-flowing Fraser occupies the northern part, two rivers, flowing in opposite directions, come so close together that they have been connected by a short canal. These are the Columbia and the Kootenay. The Columbia flows north-westward to about $52\frac{1}{2}^{\circ}$, then turns abruptly southward, encircling the Selkirk range, the southern part of the Cariboo range, and widening as it flows into the Upper and the Lower Arrow Lakes, issuing from which it receives the Kootenay, and crosses the frontier into the United States. The Kootenay, after flowing south from its source into the United States, wheels northward again into Canada, and enters the south end of Kootenay Lake (parallel to the Arrow Lakes), from the middle of which the river escapes to join the Columbia. West of the Arrow Lakes, beyond the Gold Mountains, another long, narrow lake, the Okanagan, drains southward to join the Columbia in the United States. These form the principal

north and south waterways of the province. In the northern half two considerable streams, the lower courses of which are navigable, enter the Pacific. These are the Skeena and the Stikine. On the northern border, Bennett Lake, on the Lewes River, and Teslin Lake, on its tributary, the Teslin, form the heads of river navigation to the Yukon.

The geological structure is complicated, all the formations of the continent being represented. The Cretaceous series are perhaps the most characteristic; but igneous rocks and Archæan formations occur plentifully in the Coast Range and on the plateau.

Climate.—British Columbia has every variety of climate. That of Vancouver Island is typically oceanic, with relatively warm winters and cool summers, as in England, and a heavy rainfall. The western slope of the Coast Range has a similar character, but farther inland on the plateau extremes of temperature are experienced, and there is a deficiency of rainfall in many places. In every instance where the mountains slope to the west they are covered with magnificent forests. The difference between the climate of the coast and the interior in the south of the province may be understood from the following comparison between Esquimalt in Vancouver Island and Fort Steele, on the Crow Nest Railway, in East Kootenay* :—

	Average Temperature, °F.			Average Monthly Extremes, °F.		Annual Inches.	
	Jan.	July.	Year.	Mean Min.	Mean Max.	Rainfall.	Snow.†
Esquimalt, .	38	60·5	47·5	33·8	70·8	37·5	31
Agassiz, .	32·5	66	47·5	27·9	82·3	62	49
Fort Steele, .	21·5	67	43	12·4	85·8	11·5	40

In the far north the climate is similar to that of the adjoining Yukon and Mackenzie districts.

Communications.—The Canadian Pacific Railway is the main artery of British Columbia, without which its present rapid rate of progress would be impossible. The line crossing the Rocky Mountains at Banff crosses the Columbia River twice, and then follows the Thompson River down to the Fraser and the Fraser to the sea, the terminus, Vancouver, being

* From the *Year Book of British Columbia*, 1897, p. 204.

† Unmelted.

situated a little to the north of the river mouth, on Burrard Inlet. The whole route of the railway across the province forms a succession of scenes of bewildering beauty and incredible variety. From the railway three branches run southward. The first from Revelstoke follows the Columbia River downwards to the Arrow Lakes and connects with fine river steamers which run to Trail, in the Kootenay. The new railway from Lethbridge, through the Crow Nest Pass, has been carried across the Columbia River and extended westward, parallel to the international frontier to the foot of Okanagan Lake, on which steamers ply, and the upper end of which is in railway communication with the C.P.R. This line will doubtless before long be pushed through to the coast. Other short lines connect mining centres in the Kootenay with the navigable lakes, and junctions with the railways of the United States are made in the Kootenay and near the coast. A railway also runs in Vancouver Island from Victoria, the provincial capital, to Nanaimo and Wellington. As yet there are no railways north of the C.P.R. main line; but good roads stretch northward to the various goldfields. River steamers also run on certain sections of the Fraser, and all the points on the coast are accessible by sea. Ferry steamers run to Victoria from Vancouver, and from New Westminster (about 80 miles), and also from Vancouver to Nanaimo. The Canadian Pacific Railway has also two lines of ocean steamers plying regularly from Vancouver to Japan and Hong Kong on one side and to New Zealand and Sydney on the other.

People and Laws.—The resources of the province are extremely varied, mining, agriculture, timber, and fishing being all in a state of healthy growth. The supply of labour is exceptional, because the native Indians have been trained to work on farms and in fishing, while there is a large Chinese population supplying excellent domestic service and having a practical monopoly of the laundry business and many branches of retail trade. There is, however, a strong feeling on the part of white workers against the employment of Chinese, and restrictive legislation is likely to increase. For a new country, the elaborate restrictions imposed by statute in British Columbia on every branch of enterprise would appear excessive; but there may possibly be some difference between the letter of the law and its actual application. Close seasons for fish and game are enacted, and the provincial legislature even goes to the extreme—very rare in any British possession—of refusing to give licences to fishermen, or claims to miners who are not British

subjects. Every man between 21 and 50 years of age is liable to be called upon to provide two days' labour on the roads every year without payment. The employment of Chinese and Japanese labour on various kinds of work—*e.g.*, mining underground—is prohibited, the regulations varying from time to time. As regards the prohibition of Japanese labour, the Dominion Government in 1899 disallowed the provincial law on the ground that it was in opposition to imperial interests.

The health of the new, hastily-built and overcrowded mining towns leaves much to be desired. But, as soon as there is a fair prospect of permanence, and a proper drainage system and water supply have been established, the cases of typhoid fever become less frequent and tend to disappear. The widespread use of wood for house building leads to great risks of fire. Every now and again a railway station, or, perhaps, the greater part of a town is destroyed in this way.

Forests.—The forests of British Columbia are the finest in the Dominion in respect both of size and abundance of trees, amongst which the magnificent Douglas fir (Oregon pine) is conspicuous. The red and yellow cedars are also of great value on account of their straight grain and fine appearance, and there are many other valuable coniferous and hardwood timber trees. The abundance of timber has not, however, led to a great development in lumbering, on account of the distance from markets and the practical impossibility of exporting timber eastwards by rail. The supplies have been worked mainly for local needs. Forest fires are not so destructive as in the east, and if care is taken to preserve the more accessible woods from reckless cutting they will in time acquire very great importance, not only for timber, but also for wood-pulp. Until the Nicaragua Canal is opened there is little prospect of any important export of timber from the province, although a few cargoes are sent out every year, chiefly to Pacific ports.

Agriculture.—From the mountainous nature of the province farming operations are necessarily confined to the valley bottoms, the coastal plains, and the interior plateau. The coastal plains are so heavily wooded that clearing at great expense is required before a farm can be laid out, while the valleys are subject to occasional floods, and a great part of the interior plateau has deficient rainfall, although, when irrigated, it is very fertile. North of the main line of the C.P.R. there is still very little agriculture, although some of the valleys could be utilised, and the return of prosperity to the old goldfields should create a good market. Along the railway, and especially in the neigh-

bourhood of Kamloops, there is good ranching land, and irrigation would render a large area available for keeping cattle. The Lower Fraser valley and the delta of that river round New Westminster are at present the districts where farming has had most attention, and if the low lands bordering the river could be permanently protected from floods they would become prosperous through agriculture alone. One of the Dominion experimental farms is situated at Agassiz, on the Fraser. South of the main line of the C.P.R., in the Okanagan district, fruit farming has been found very successful, and hops are there cultivated with good results, the necessary cheap labour being supplied by the native Indians, families of whom ride in from near and far and pitch their tents picturesquely round the hop-fields in the picking season. This district contains good pastoral land also, the scenery much resembling that of the southern uplands of Scotland, and it is peculiarly favourably situated for transport. The Okanagan Lake, which is navigated by steamers, is connected at the north end, where Vernon is the chief town, with the main line of the C.P.R. at Sicamous, and at the south end at Fairview near Penticton with the extension of the Crow Nest line leading to the mining towns of the Kootenay. The western division of the Kootenay has comparatively little land suitable for farming; most of it in the low ground of the Kootenay River and the head of Kootenay Lake, which has been embanked against floods, the rest of the country being forest-covered or bare mountain side. In East Kootenay there are good ranching lands, where farming is also possible by the aid of irrigation. The chief centre for farming is at Fort Steele, but there is, of course, competition with the great ranches of Alberta in supplying the mining population along the Crow Nest Railway.

The most profitable stock has been found to be swine; cattle also are in good demand, but sheep are little kept, although from the appearance of the hillsides of the interior plateau there would appear to be good pasturage for them in summer at least.

The agricultural prospects appear to be best for fruit, all varieties of which, from apples to grapes and peaches, thrive on irrigated land in the southern part of the interior plateau, and for hops. There is a future also for market gardening, which is at present almost a monopoly of the Chinese settlers. Hemp and flax might also probably be cultivated; experiments certainly show that flax thrives well in the New Westminster district and at Agassiz; but for a long time to come the produc-

tion of food for the mining population is likely to occupy the attention of the farmers of British Columbia.

The discovery of new placer mines has a tendency to withdraw attention from farming for a time, as only experience teaches that certain profit attends the supply of food to miners, while the personal search for gold is a precarious speculation.

Improved farms in the neighbourhood of towns are not cheap, but there is abundance of land to be had in remoter parts at low rates, or free on performing homestead duties. Homesteads are granted by the Dominion Government in the railway belt 20 miles on each side of the line, and in other parts of the province by the Provincial Government, but, as a rule, only in remote parts of the country where there is little inducement to settle.

Fisheries.—The fisheries of the province are extremely important, and still capable of much development. In total value they were equal in 1896 to the gold and silver produced in the province, and British Columbia ranks with New Brunswick, and is inferior only to Nova Scotia in the value of its fisheries. The chief industries are those of the capture and canning of salmon, which are carried on mainly near the mouths of the Fraser in the south, and of the Skeena in the north. The fishermen are largely the coast Indians, who are magnificent boatmen and boat-builders, and the work in the canning factories is mainly done by Chinese, under white superintendence. The Quinnet, Chinook, or Tyee salmon (*Oncorhynchus tshawytscha*) is the variety most esteemed for food, and runs in spring, or from November to April; but the sock-eye or blue-back salmon (*O. nerka*) is preferred for canning, on account of the deep red colour of its flesh, and its amazing abundance. The great shoals begin to enter the rivers in July, and continue throughout August; a third variety, the Coho salmon (*O. kisutch*), of less value, appearing in September. As many as 2000 boats have been seen at work off the Fraser River in autumn, and each boat may, under favourable conditions, catch from 100 to 500 fish in a night. The export of canned salmon in 1897 amounted to 1,000,000 cases of 48 lbs. each.

Halibut fishing all along the coast, and especially round the Queen Charlotte Islands, has recently assumed considerable proportions, the fish being of remarkable size and quality. They are usually dispatched in ice by rail to eastern Canada and the United States. Many other varieties of fish are also to be obtained.

Every fisherman requires a licence, costing \$10 per annum. There is a good deal of legislation as to fishing, including the

imposition of close times, the prohibition of Saturday and Sunday fishing for salmon, and of obstructions in rivers which might cut the fish off from their spawning ground.

Mining.—The mines of British Columbia are its greatest source of wealth at present, and if they continue productive long enough to attract a large population and encourage agriculture, lumbering, and fishing, they will make the colony permanently prosperous.

Gold and Silver.—British Columbia has been famous for its placer goldfields since 1858, but the development of the country through gold has been fitful, and subject to long periods of depression. Since the commencement of lode mining, however, the production of gold promises to become a steady source of prosperity, which will lead to improved communications, and help to develop all the resources of the country. The gold produced in British Columbia in 1897 amounted to \$2,724,000, nearly half of the output of the Dominion, but the province now ranks second to the Yukon.

Gold has been found in almost all the rivers of the province, and auriferous rocks have been discovered in so many parts of the country that it is probable that no district is without a supply of the metal, which it may pay to work. Naturally, however, it is only the richest regions that have become sufficiently well known to attract public attention, and hitherto mainly the placers. To recount all the places where signs of gold have been found, would be merely to detail the geography of the province, as far as it is known. It will only be possible to indicate the regions where the appearances promise a large future supply.

Gold was first worked in the canyons of the Fraser River, and the prospectors quickly made their way to the upper tributaries where the Cariboo field once had immense camps. More productive placers drew away the fickle "diggers," but within the last few years the gold of the Fraser has been attacked by modern methods. Dredgers have been set to work in the river itself, and yield a fair return. Hydraulic mining is practised in the Quesnelle and Barkerville districts, about 300 miles from the junction of the Fraser and Thompson, on a very large scale, there being no agricultural land near enough to be damaged by the tailings, and no serious risk of silting up the navigable part of the river. Some of the banks of old river gravel attain a thickness of 200 feet and over, and yield a good return when washed. In some places, however, the deeper gravel is cemented into a solid mass which must be quarried and crushed in order

to liberate the gold. The work is necessarily in the hands of large companies whose operations are sometimes of a gigantic nature, involving in certain instances the damming back of lakes in order to lay bare the beds of the effluent rivers. The route to the Cariboo fields is by coach on a good road, with excellent inns, the journey occupying three days from Ashcroft on the C.P.R., which can be shortened by a night's steamer journey on the Fraser from Soda Creek to Quesnelle. Barkerville is one day further by road.

In the far north of the province promising goldfields are being opened up on the Omineca River, one of the head streams of the Peace River, and only accessible by trails or rough pack roads; in the Cassiar district, which is reached by steamer up the Stikine River to Telegraph Creek, and thence by trail; and on the Atlin Lake, which is easily reached from Lake Bennett, the terminus of the White Pass railway from Skagway. These mines, however, have not proved very attractive to individual miners, and it is believed that they will only yield a fair return when hydraulic working has been introduced.

The Lillooet mines, on the Cayush Creek, about 40 miles up the Fraser from Ashcroft, yield a return from quartz mining.

The richest rock mines, and those that promise greatest permanence, on account of the immense quantity of low-grade ores present, are those of the West Kootenay, now approached by the Columbia River steamers from the C.P.R. line on the north, by the Crow Nest Pass line on the south, and by direct rail from the United States. This region contains mountains rising to 8000 feet above the sea, divided by deep valleys. The rocks are largely Archæan and igneous, great intrusions of granite occurring in parts. The gold ore is usually in the form of pyrrhotite—not unlike the nickeliferous pyrrhotite of Ontario—and chalcopyrite, occurring in a rock of dioritic character. This ore is a complex combination of sulphides of copper and silver with gold, and has to be subjected to elaborate metallurgical processes before the gold can be obtained. The copper forms a valuable bye-product. Hence there is no possibility of success from individual attempts at mining.

The chief centre is the town of Rossland, situated at a considerable elevation on a bench, or old river terrace, on the steep slope of a mountain in which the mines are worked by horizontal galleries and shafts. The winter is very cold on account of the altitude, and, until the opening of the Crow Nest line, communication in winter, after the withdrawal of the Columbia steamers, was very difficult. In less than five years Rossland has

attracted a population of over 8000, and has been laid out in streets, where buildings of stone and brick are rapidly replacing the first wooden shanties. The ore is sent by rail to Trail or Nelson on the Columbia river to be smelted.

The mining at Rossland appears to be on a more permanent basis than that in districts where placer workings are relied upon, and with the advance of prospecting a number of small mining towns will arise in the district, forming good markets which should encourage agriculture on the available lands in the neighbourhood.

Silver, mainly in the form of silver-lead ores, is obtained in great quantities both in the West and East Kootenay districts from many mines. The average proportion of silver exceeds 200 ounces to the ton of lead. The importance of these ores has led to the construction of very difficult railways from the Arrow Lakes, Slocan Lake, and Kootenay Lake to Sandon. The Slocan district has proved the most productive. The industry is being carried on with great energy; but new deposits are still being met with, and, as the geological survey of the province proceeds, the labours of the prospectors will be guided to other regions where great results will doubtless also be obtained.

Coal, of excellent quality, is abundant in the Cretaceous rocks of Vancouver Island, where it is mined to the amount of nearly 1,000,000 tons per annum, in the neighbourhood of Nanaimo, for export to the mainland ports of British Columbia and of the United States. Farther north, at Comox, there are also workings, and the area of good coal is believed to be greater than at Nanaimo. In the Queen Charlotte Islands large quantities of coal exist, some of which, on Skidegate Inlet, is anthracitic in character. On the mainland coal has been reported at several points on the Fraser and Thompson Rivers, on the Skeena River, and in the almost unknown region in the north-east. The finest fields are, however, in the Crow Nest Pass, and this region is sure of prosperous development on account of the demands for working the machinery and the smelters of the Kootenay district. Extensive coking ovens have been established at Fernie to supply the fuel required for the smelters.

Iron ores of good quality are abundant in many places throughout the province, but no metal has, as yet, been manufactured.

Mica deposits of fine quality yielding unusually large sheets of the mineral occur in the upper Fraser Valley, close to the Yellowhead Pass, but can scarcely be worked on account of the

long journey of seventeen to twenty-five days by pack-horse required to reach Kamloops or Edmonton, the nearest railway points.

Mining Laws. — Miners require to take out a mining licence, costing \$5 per annum for individuals and \$50 or \$100 for companies, according to capital. All claims must be pegged out, and particulars written on the "discovery peg," before registration is possible, and they must be registered within certain time limits from the date of discovery. In quartz mining a claim is 1500 feet square, and may be bought outright for \$500, or held as long as \$100 per annum is spent in working it, or, in default of working, paid as rent.

Leases of not more than five miles of the bed of a river may be granted for twenty years for the purpose of gold dredging. Claims for placer mining measure 100 feet square, except in the case of creek claims, which are 100 feet long, and extend from base to base of the hills. A placer claim must be worked continuously, and is liable to be forfeited if untouched for 72 hours, "except for reasonable cause, satisfying the Gold Commission."

A licence to prospect for coal on 640 acres of land costs \$50 for one year, and if coal is found a lease may be obtained for five years at the rate of ten cents an acre, and a royalty of five cents per ton of coal raised. If contiguous claims up to ten are located by miners working in partnership, they may be permitted to concentrate the working upon one claim without forfeiting the others. No boys under twelve, no females of any age, and no Chinamen are allowed to be employed underground in any mines, and there are numerous regulations in force for the safety of the miners. The mining laws are extremely voluminous and minute, as many as twenty-four Acts dealing with mines and mining having been passed by the Provincial Parliament between 1888 and 1898.*

* *Statistical Year Book for Canada*, 1897, p. 158.

CHAPTER VI.

NEW FOUNDLAND.

Position and Government—The French Shore—People—Surface—Climate
—Communications—Fisheries—Farming—Mining—Mining Laws.

Position and Government.—Although the oldest British colony, Newfoundland still remains one of the least developed, so far as the land is concerned, because it has been used mainly as a landing place for fishing fleets and the headquarters of sealing vessels. The island lies at the entrance of the Gulf of St. Lawrence, and is the portion of America nearest to Europe, being only 1700 miles from the west coast of Ireland.

The area is about 42,000 square miles, and the population, at the census of 1891 (including the coast of Labrador), was 202,000. The government is that of a ministry responsible to the Colonial Parliament, a governor being appointed by the Colonial Office in London to represent the British Crown. The coast of Labrador is under the jurisdiction of Newfoundland.

The French Shore.—By a curious interpretation of an old treaty, the west and north coasts of the island itself can scarcely be viewed as part of the colony. By the Treaty of Utrecht, in 1713, the French were confirmed in the possession of the two little islands, St. Pierre and Miquelon, and were also guaranteed the right of landing and drying their nets and curing fish on the west and north coasts of Newfoundland, these being known now as the *French Shore*. In 1783 the Treaty of Versailles further provided that the French, in using the French Shore, should have "freedom from interruption by the competition of the British." Unfortunately, the exact nature and extent of these rights have never been defined, and many misunderstandings between British and French fishermen have resulted. The prosperity of the colony has been retarded, and the uncertainty as to the treaty rights and disabilities was one of the causes which has kept Newfoundland outside the Dominion of Canada. A *modus vivendi* with the French Government, arrived at in 1898, is expected to be extended over 1900; but a final understanding is much to be desired.

People.—About one-third of the population is Roman Catholic in religion, nearly one-third belong to the Church of England, and the remainder are chiefly Methodists. The coinage of the island is similar to that of Canada. The current rate of wages is lower than in any part of the Dominion, but the cost of living is also lower in the same proportion.

For many years the condition of Newfoundland has been unsatisfactory from a financial point of view, and although vigorous efforts have recently been made to develop the country, it cannot as yet be termed prosperous. The people are almost all colonial born, immigration being very small; while there is a strong tendency to emigration, encouraged, perhaps, by the seafaring habits, but possibly due in part to the difficulties hitherto found in making a livelihood by work on land.

Surface.—The island is rugged in character, the coasts are deeply cut up into a vast number of bays and peninsulas, and the rough uplands of the interior remain still but little known, and practically uninhabited. On the west coast the land rises abruptly from the sea to form a line of heights known as Long Range, attaining about 2000 feet in the highest part; and from the summit the land undulates away across the island, forming an irregular plateau, gradually falling towards the east coast.

Geologically, Newfoundland is part of the great Archæan mass of North America, mainly Laurentian, but Huronian in the south-east. At various points round the coast, and here and there in the interior, there are patches of old sedimentary rocks, mainly Silurian and Carboniferous. No formations more recent than the Carboniferous are found except the glacial clays, which cover a considerable part of the surface. The interior is diversified by many lakes of all sizes, usually called ponds, most of them—so far as is known—running from south-west to north-east, and draining to the east coast. The Humber is the only river of any size which crosses the Long Range and enters the sea on the west. The eastern rivers are much longer, especially the Exploits, which nearly bisects the island, and falls into the Bay of Exploits; and the Gander system, which enters Gander Bay by one branch and Bonavista Bay by another. None of the rivers are navigable for craft larger than canoes.

The banks of these rivers are wooded with well-grown pine and other coniferous trees, and with birch; and a certain amount of lumbering has been carried on for a long time, although never on a large scale. Forest fires have done much damage near the railway. The rest of the interior is very

rugged, treeless, and barren, being covered mainly with moss and shrubs; and as yet the greater part is unsurveyed, and a great deal of it even unexplored.

Climate.—The climate is less severe than that of most parts of Canada, the winters being warmer—temperatures below zero Fahrenheit rarely occurring—and the summers are like those of the north of England. The rainfall is ample, but does not appear to exceed 40 inches per annum, and in winter snow does not lie so thickly as in eastern Canada. But there is not the same amount of clear sky or dry atmosphere as on the mainland. In summer the east and south coasts are tormented with fogs, due to the cold Labrador current; but the west and north coasts do not suffer so much, and the sea-fogs do not penetrate far into the interior. The occasional stranding of a large iceberg on the coast has a remarkable effect on local climates, and an iceberg is often held responsible, by its chilling of the air, for the failure of crops to ripen.

The coast of Labrador is dreary in the extreme; although lying in the same latitude as the British Islands, it has an Arctic climate, on account of the ice-laden currents which drift along it, and it is only visited by fishermen and sealers in the summer. Its mineral character is almost unknown, but it would not be surprising if iron and other ores were found to be abundant.

Communications.—Direct steamers of the Allan line run fortnightly in summer from Liverpool to the port of St. John's, the capital, in the south-east; and there is communication by steamer from Halifax, Nova Scotia, all the year round. Small steamers ply along the south coast all the year, and along the east and west coasts for nine months. A railway across the island was opened in 1897. It runs from St. John's through the peninsula of Avalon, north to the Gander and Exploits Rivers, curving westward to the Humber, and thence south along the west coast to Port aux Basques at the extreme south-west. A steamer runs thence to Cape Breton Island, and connects with the Intercolonial Railway. It is hoped that the line across Newfoundland will form a link in the shortest sea passage between Europe and America—a passage which steamers of the most powerful type could reduce to a little over three days in favourable weather.

Several of the European telegraph cables are landed at Heart's Content, in Trinity Bay, and land wires place all the settlements on the three coasts (south of 50°) in communication with the capital. Outside the peninsula of Avalon in the south-east, where most of the population is concentrated, there are no roads.

Fisheries.—Nine-tenths of the inhabitants are engaged in fishing and in industries connected with fish; indeed, scarcely any attention has hitherto been paid to anything else. Practically the whole export trade (averaging a little over \$6,000,000 per annum) is in fish, mainly dried and salted cod caught in summer on the Grand Banks and in the inshore waters. Salmon are also caught and cured in summer, and in winter herrings are fished and exported in a frozen state. The canning of lobsters has recently acquired great dimensions, and this trade is one of the chief causes of friction on the French Shore. Seal-hunting is also a pursuit of some importance.

While the native population always turn their eyes to the sea for occupation and support, newcomers may look inland, where much hard work and a rough life will probably in time result in a comfortable livelihood. The amount of timber fit for the lumber trade is not very great, but there is an immense supply of small wood suited for pulping, and the manufacture of wood pulp has already been commenced.

Farming.—Agriculture has been much neglected, but is improving, although there is scarcely a farm in the colony out of sound of the sea. About 65,000 acres of land were cultivated in 1891. There is a good deal of very fair farming land round the heads of the bays and in the valleys of the chief rivers, which are tapped by the railway, but road-making on a considerable scale will be required before farming can really pay. As regards crops, wheat is not likely to yield good results, but oats, barley, buckwheat, rye, and root crops, especially potatoes, do well. There seems to be no future for farming on or near the south coast. The Humber Valley, opening to the west, contains perhaps the best land, but the Exploits and Gander Valleys on the east and several places along the south-west coast, all near the railway, are promising. As yet they are nearly all untouched. Insects are said to do a good deal of damage to crops.

There are great areas of first-rate grass for pastoral purposes, and the farmer should look to live stock rather than to tillage as his main support. There is summer pasturage even in the parts of the island known as the Great Barrens on which cattle and sheep thrive. The great difficulty, however, is the supply of food and shelter for stock during the winter months. This would involve a great increase of hay-harvesting and root-growing, and the introduction of artificial grasses. The chief advantage of Newfoundland for rearing live stock is the short voyage to Europe, as compared with Montreal or New York. If the trade

were properly organised there should be no difficulty in landing cattle at Liverpool within a week of their leaving the pastures.

Land for agricultural purposes may be obtained free, as in Canada, by settling upon it, building a house and improving the soil, no payment beyond a homestead registration fee of \$10 being required. Crown lands may be purchased in quantities up to 600 acres at not less than 30 cents per acre, and subject to the condition that 10 per cent. of the land shall be cleared and occupied within five years. Occupation licenses are also granted at a very moderate rate, with a right to ownership if the land is improved, occupied, and cultivated for five or ten years, according to circumstances.

It is doubtful if agricultural immigrants will be attracted to Newfoundland in large numbers; for, although a living can probably be made, the conditions of life are no better—unless proximity to Europe be counted an advantage—than in the rich lands of the west of Canada.

Mining.—*Gold-bearing rocks* have been found in the south-east at Cape Broyle, about 40 miles south of St. John's, and specimens are said to have yielded 3 ounces of gold to the ton. The gold, so far as is known, occurs in combination with other metals, and must be separated by elaborate processes after crushing. As nearly one-third part of the island is made up of Huronian rocks, with which, in America, gold is usually associated, it is not improbable that the metal may be found in considerable quantity. The south-eastern corner of Newfoundland may roughly be said to be underlain by Huronian rocks, while the rest is mainly Laurentian; the dividing line runs from the western side of Bonavista Bay across the island south-westwards to the western side of Fortune Bay.

The mines which have been worked to the greatest extent are those of *copper*, the ore (copper pyrites) being exported, for the most part, unsmelted. Copper is mined at many places along the east coast, the supply is large, and the output could easily be greatly increased. The actual value of copper ore exported in 1897 was only £84,000, much less than the value of the tinned lobster exports. As yet there has been practically no prospecting for copper or other ores in the interior of the island.

Nickel is found, associated with copper, at Tilt Cove on Nôtre Dame Bay, and was worked when the price of the metal was high.

Iron ore also occurs in immense abundance, and some of it is very rich. Hematite and magnetite are worked already to

some extent. Bell Island, in Conception Bay on the east, is particularly rich in brown hematite, which occurs close to the surface, and can be quarried out and delivered by shoots into vessels lying in deep water. On one occasion 1800 tons of iron ore were loaded in this way directly into the holds of a steamer in 4 $\frac{3}{4}$ hours. Iron pyrites is extensively mined on Pilley's Island in Exploits Bay, and exported to the United States for the manufacture of sulphuric acid.

Chrome iron ore occurs in the cliffs of the west coast at Port-au-Port, and is being worked, although, on account of powerful monopolies in the chrome ore trade, it is sometimes difficult to secure a market.

Lead and silver ores have been found and tested on the shores of Placentia Bay, and are probably widely distributed. They also appear at Port-au-Port on the west coast, where mining was begun in 1875, but was stopped on account of disputes as to the rights of the fishermen on the French Shore.

There are considerable deposits of *coal* in the Carboniferous strata of the neighbourhood of St. George's Bay, on the west coast, and near Grand Lake, both localities being on the line of railway. This coal should be of great value as fuel for smelting the various ores; and in many ways Newfoundland is peculiarly well fitted for metallurgical enterprises. There is no great extent of fertile land, nor forests of such value as to make the establishment of extensive metallurgical works objectionable to other industries; and in the course of time the innumerable deep inlets of the coast might give rise to a steel shipbuilding industry from native supplies. This, however, must remain a dream of the remote future, unless large capital were devoted to the purpose; at present capital can be applied elsewhere with better prospects of a quick return.

Serpentine rocks are extensively represented, and *asbestos* of fair quality occurs in them. The serpentines are also looked upon as a guide to copper deposits, copper ore frequently occurring in the schists through which the serpentine dykes run. Other mineral products such as gypsum and building stone occur in abundance. There is one remarkable granite quarry in which the rock occurs naturally split up into blocks of various sizes, so rectangular and uniform, that shiploads have been dispatched ready for use as building material without any cutting or trimming.*

* A. E. Outerbridge, "The Undeveloped Mineral Wealth of Newfoundland," *Journal of the Franklin Institute*, Philadelphia, vol. cxliv. (1897), p. 168.

Petroleum has been found near St. Paul's Inlet, about the middle of the west coast, and is being worked.

There is no doubt that Newfoundland abounds in mineral wealth. Were it not for the immense richness of its fisheries, this would have attracted attention long ago, because so much is exposed to view in the best positions for working and shipping in the cliffs of the deep-water inlets. The fishing people cared nothing for the minerals, and many stories are current of how their ignorant appreciation of accidental qualities drew the attention of prospectors to the supplies. Thus a pretty yellow stone set as an ornament on the chimney-piece of a fisherman's cottage led to the discovery of the copper mines of Nôtre Dame Bay; the heavy "stones" taken on board as ballast, and thrown carelessly ashore at St. John's, led to the discovery of the hematite on Bell Island;* while the brilliant carmine paint on the bottom of a fishing boat seen as she heeled over in a squall, served to reveal a mine of silver ore, which an unkind landslip buried beyond rediscovery before it was utilised.† Now that a railway has been built across the island, there will undoubtedly be a great impulse given to prospecting in the interior, and within a few years there will be some evidence from which to judge of the part mineral wealth may take in developing this oldest, but least known, of British colonies.

Mining Laws.—A license to search for gold over an area of 320 acres costs \$25 for one year, and twice as much for a second. A gold mining lease of an area of one quarter of a mile square (40 acres) is granted at the rate of \$50 per annum for a period of 21 years, with an obligation to spend at least \$500 per annum in working each area.

A mining license for one square mile of land costs \$20 for the first year, \$30 for the second, and \$50 for the third, with certain obligations as to working. A mining lease, conveying the right to the minerals under 1 square mile of land, and to the occupation of 50 acres of surface, is granted to the holder of a mining license for a period of five years on payment of \$25. The holder must, however, expend at least \$800 during each of the first four years, and \$2800 during the fifth year in working the minerals, and as soon as he can prove the expenditure of \$6000 he is entitled to a grant of the minerals in the square mile, and of the 50 acres of land.

* Harvey, *Newfoundland in 1897* (London, 1897), pp. 89 and 94.

† Outerbridge, *Journal of the Franklin Institute*, Philadelphia, vol. cxliv. (1897), p. 170.

CHAPTER VII.

THE UNITED STATES.

Growth and Progress—Position and Boundaries—Configuration—Climate—Communications—Resources—Agriculture—Stock Raising—Mining—Coalfields—Petroleum—Metals—Manufactures—People—Settlement of the Country—Government and Laws—Aliens and Naturalisation—New Lands of the United States—Acquisition of Public Lands—Gulf States—Mississippi—Alabama—Florida—Texas—States of the Great Lakes—Michigan—Wisconsin—Minnesota—Central States—North Dakota—South Dakota—Nebraska—Kansas—Arkansas—Missouri—Oklahoma—Cordilleran and Plateau States—Wyoming—Idaho—Montana—Pacific States—California—Oregon—Washington—Alaska—Position and Area—Administration and Laws—Ports and Communications—Climate—Possibility of Agriculture—Resources—Gold in Alaska—Cape Nome Goldfields—Coal in Alaska.

Growth and Progress.—The history of the United States of America since the declaration of independence by the thirteen British colonies of the Atlantic coast, in 1776, is a record of the most remarkable and continuous progress ever known, in the development of a vast unoccupied region, and the creation of a great nation. With the exception of Nova Scotia and Prince Edward Island, no province of the Dominion of Canada is at present one-half so densely peopled as the average of the whole United States. In area and population the United States exceed any other civilised Power under a single government except Russia; and no other country in the world, except possibly China, contains three separate towns each with a population exceeding one million, like New York, Philadelphia, and Chicago. In wealth and enterprise, and in the intelligence displayed in utilising their resources, the people of the United States have no superiors. Hence it is now more natural to class that country along with the fully occupied countries of Europe than with the undeveloped lands of the New World.

There is still, however, vast and almost unlimited scope for development and increase in prosperity; but this will come about rather by the adoption of improved methods, the invention and adaptation of which are characteristic of the American people, than by the opening up of new lands from the outside,

and more and more by the redistribution and natural increase of the existing population than by the continuance of the vast immigration which has taken place during the past half century. The story of the westward march of population is a very remarkable one. There were 305,000 square miles of settled land in 1800 confined to the Atlantic border, 980,000 in 1850, and 1,950,000 in 1890. As the rich lands of the centre of the continent were taken up, and railways placed them in easy communication with eastern markets, the old, infertile farms of the east dropped out of cultivation, and, with the increasing prosperity of the country, the population of some of the north-eastern states has actually declined. Yet, for many years to come, the States will continue to attract young and ambitious men from every quarter of the globe; and although competition in every department is keen, and the whole machinery of life runs at high pressure, there is no country in the world where the prizes open to individual work and native merit are so numerous or so great. The freedom from many of the traditions and conventions which hamper progress in the Old World has allowed free scope to modern ideas of organisation, government, and social life in the New; but modern abuses of power in the formation and working of monopolies on a gigantic scale in trade, labour, and politics threaten, in some cases, to neutralise these advantages to the community at large.

Position and Boundaries.—The United States occupy the whole breadth of the North American continent, from the Atlantic to the Pacific; this huge slice being the very choicest portion, neither penetrating into the tropics on the south, nor approaching the sub-Arctic region on the north. The limits of latitude are 49° on the north, along the parallel which forms the Canadian boundary, and 25° at the extremity of the Peninsula of Florida on the south. There are land boundaries on the north with Canada (see p. 30), and on the south with Mexico, the latter being formed by the Rio Grande, from the Gulf of Mexico to about 32° N., and thence by an irregular line across the plateau to the Pacific Ocean, which is met nearly in 33° N. The frontiers have been surveyed, and columns erected along them at intervals. The area between these limits is estimated at 3,025,600 square miles. The outlying territory of Alaska, in the extreme north-west of America, the uncertain boundaries of which are referred to at p. 31, contains an additional area of about 570,000 square miles. In 1898 outlying island possessions were acquired, including Cuba and Porto Rico in the West Indies, and Hawaii, the Philippine Islands,

and Guam in the Pacific, while in 1899 Tutuila island in Samoa was added. The total area may be compared in size with the Dominion of Canada, or the continent of Australia, than either of which it is at least twelve times more populous, or with Europe, of which the States contain only one-sixth the population.

Configuration.—The configuration of the main body of the country is very simple. The great lakes lie on the north, and, except for the Red River of the North, which flows into the province of Manitoba, and the Columbia River, which rises in the province of British Columbia, the whole hydrographic system lies in the country itself. The great Missouri-Mississippi Valley forms the centre of the United States, stretching from near the great lakes to the Gulf of Mexico, and receiving large tributaries from east and west. The flat expanse of the centre of the Mississippi Valley is known as the Prairies, and forms the greatest stretch of rich treeless agricultural country in the world. On the east the prairies rise up to the broken country of the low Appalachian Ranges, which form an irregular watershed separating the Mississippi basin from the low coastal plain which borders the Atlantic and sweeps westward round the Gulf of Mexico. To the west the prairies rise more gradually to form the Great Plains which, lying at altitudes up to 6000 feet, run along the whole length of the States to merge in the prairie steppes of Canada. These great plains, deeply seamed by the valleys of the long tributaries of the Mississippi, lead up to the abrupt and lofty range of the Rocky Mountains, whose peaks exceed 14,000 feet in height, and which form the watershed between the Atlantic and Pacific. Beyond the crest the Rocky Mountains sink to the level of a lofty plateau, which in one portion forms a large inland drainage area, known as the Great Basin, and containing Great Salt Lake; but otherwise diversified by many high mountain ranges, deep valleys, and profound canyons. The plateau is bordered on the west by the Sierra Nevada, and Coast Ranges, between which lie some remarkably sheltered valleys, and through which great rivers—especially the Colorado in the south and the Columbia in the north—make their way, gathering in their courses the waters of many tributaries.

Climate.—The dividing lines between all the grand natural divisions run from north to south, and there is a striking absence of mountain ranges in an east and west direction. The result upon the climate is very marked. Extreme range of temperature and quick variability characterise it, on account of the

ease with which cold winds from the north in winter, and hot winds from the south in summer, can sweep its whole length. The tempering influence of the sea is excluded by the Coast Range on the west and the Appalachians on the east, so that the interior is little affected by the ocean. The mean annual temperature varies greatly with the latitude, ranging from 40° F. in the north-west to 75° in the south of Florida. A mean temperature, equal to that of the British Islands, prevails, as a rule, along a belt from 40° to 42° N.—*i.e.*, more than twelve degrees farther south than in Europe, but the range between summer and winter is very different. In winter the cold over all the northern states is severe. In the west it is worse than in the North-West Territories of Canada, on account of the less pronounced action of the Chinook winds, and the occasional occurrence of blizzards or snow tempests, which no living creature can withstand. The heat of summer is no less pronounced in all parts of the country, except in places where it is modified by altitude. The central prairies of the Mississippi are subject to the visitation of tornadoes or whirlwinds, which work extraordinary havoc, destroying trees and houses in their track. Yet, despite all these disadvantages, the climate as a whole is not only healthy, but the air is stimulating and exhilarating in a remarkable degree.

The distribution of rainfall is naturally much influenced by the configuration. To the south-east of a line drawn from the Mexican frontier, at the Gulf of Mexico, to the outlet of Lake Ontario, the total annual precipitation exceeds 40 inches, and the same is true for most of the Pacific coast and the western faces of the Coast Range and the Sierra Nevada. But almost the whole of the great strip of land between 100° and 120° W. has a rainfall under 20 inches, and a very large part of it, on the great plains and the plateau, has under 10 inches, which is far too little to permit successful agriculture, or even in some cases to allow of the growth of pasture grass. In these arid and sub-arid regions, the value of farming land is expressed, not by the amount of land held, but by the amount of water available for irrigation.

The attention paid to meteorology is such that no country in the world is better supplied with predictions of coming weather changes than the United States. The Weather Bureau distributes its warnings to all parts of the country by telegraph, and special signals are displayed by railway trains in some of the thinly peopled districts. This systematic dissemination of weather forecasts is rendered possible by the vastness of the

area from which the necessary data is derived, and is of great practical utility to all concerned.

Communications.—The eastern ports of the United States, of which New York is by far the most important, are reached by the fastest steamers from Liverpool and Southampton, a voyage of a little over 3000 miles, in six days. It is upon this route that the highest developments of fast and luxurious ocean travel have taken place. On the western side, the magnificent harbour of San Francisco (3000 miles, or six days' continuous travel by rail from New York) communicates by means of regular lines of steamers with Japan, China, Hawaii, the Philippine Islands, and Australia.

Traffic on the rivers and canals is now mainly confined to the carriage of goods, the enormous mileage of railways having reduced the river passenger traffic, once the largest and most luxurious in the world, to very moderate dimensions. In 1850 there were only 9000 miles of railway in the United States; in 1880 they had increased to 93,000 miles, while in 1897 they had reached the immense total mileage of 184,600 miles. This gives one mile of railway for every 23 square miles, or for every 390 inhabitants, which may be compared with 1 mile for every $5\frac{1}{2}$ square miles, or for every 1870 inhabitants—the proportions which exist in the United Kingdom. A great deal of the rapid development of the United States is due to the enterprise with which railway lines have been pushed out into uninhabited regions in advance of settlement, and to the competition produced by the duplication of lines between all the more important centres. There are, for instance, five separate routes by which, within the borders of the United States, the continent can be crossed from ocean to ocean.

Resources.—With their vast and varied natural resources, the United States approach more nearly than any other country to the ideal of being absolutely self-sufficing. No necessities need to be imported, except possibly tea and coffee, while everything else could be, and is to a great extent, produced within their boundaries. Yet, pending more economical methods of working, tropical produce, raw materials, and particularly manufactured goods, are still imported in large quantities, the latter in spite of heavy protective duties.

The chief support of the States is farming, including under this term the cultivation of food products, and of raw materials for manufacture, and the raising of live stock. Every year, however, manufactures are becoming more important, and before long factories and not farms will provide the larger share of

national wealth, if, indeed, the time is not already come. While the United States have not the same necessity for maintaining a great export trade as weighs upon a country of more limited resources, the exports supply certain indications as to the produce of the country. The following is, in round numbers, a statement of the value of the chief exports for the year 1897-98:—

Products	Dollars.	Pounds Sterling.	Per Cent. of Total.
Agriculture,	854,000,000	171,000,000	70·70
Mines,	20,000,000	4,000,000	1·66
Forests,	38,000,000	7,600,000	3·15
Fisheries,	5,500,000	1,100,000	0·46
Manufactures,	290,500,000	58,100,000	24·03
Total,	1,208,000,000	241,800,000	100·00

Agriculture.—Nearly the whole of the area of the United States east, and some very rich valleys and coast strips west, of the Rocky Mountains, are available for cultivation, or in the drier region for cattle ranching or irrigation farms. The nature of the staple crops necessarily differs according to the climate. The coastal plain of the South Atlantic and Gulf of Mexico is mainly devoted to cotton-growing, an industry of immense importance, and largely dependent on negro labour. Tobacco, although cultivated in almost every state, is most important as a crop in the states lying just north of the cotton-growing region, and especially in Kentucky and Virginia. The area of prairie land between the Ohio River, the great lakes, and the Great Plains of the west, is the richest grain-growing region in the world, its staple crops being maize (universally called “corn” in the United States), wheat, and oats. To this region must be added the rich California Valley. The states which produce the greatest quantity of Indian corn are those of the centre—Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska. Those in which wheat is most largely cultivated lie farther to the north and west.

The greatest wheat-growing states in 1897 were Minnesota, California, Kansas, North Dakota, South Dakota, Indiana, and Ohio. In Minnesota and the Dakotas, which occupy part of the same rich land as Manitoba, which lies just to the north of them, wheat cultivation absorbs practically the whole energy of the population, and wheat is grown to the exclusion of other crops.

Hence, as the population is small, these states have a large surplus available for the supply of the eastern industrial states, which do not raise nearly enough for their own food supply, and beyond this also for export. As long as the wheat crop in the western states continues to provide more than sufficient to supply the east, the United States will continue to be a wheat-exporting country; but this cannot go on always. The virgin soil available for ploughing diminishes in extent every year, and every year the increasing exhaustion of the soil under cultivation demands the aid of fertilising agents, so that the boundary line of land, upon which manure has become necessary, is constantly creeping farther and farther west. Agriculturally speaking, land in need of fertilisers is already old land, and the cost of cultivating it steadily increases. The time when the whole wheat crop of the United States will be needed for the food of its own people, although in sight, is probably far off. The handling of the crop in the north-western states illustrates the latest developments of industrial economy, which the possession of cheap land, combined with dear labour, can stimulate an inventive people to employ.

Oats are grown everywhere in the north, but the states devoting the largest acreage to this crop are Iowa and Illinois, where it has sometimes been found more profitable than wheat. Although mainly used as food for horses, the use of oats as human food is rapidly increasing in America,* a fact curiously in contrast with the state of things in the United Kingdom, where—especially in Scotland—oat-eating communities have been largely converted to the use of wheat, a change not wholly advantageous.

Although these products are specially mentioned on account of their immense preponderance, there is no farm product of the temperate or sub-tropical zones which does not go to swell the vast agricultural wealth of the United States. Taking the country as a whole, the areas devoted to the leading crops, and the yield, are given in the following table (p. 125).

In 1890 the number of separately occupied farms in the United States was 4,500,000, but although the number of farms had increased steadily, the proportion of the population engaged in farming had notably diminished. In 1870 fully 47 per cent. of the wage earners were engaged in agriculture; in 1890 not quite 37 per cent. were so employed. The decrease is accounted for by the more rapid development of manufacturing industries.

* H. Gannett, in *Stanford's Compendium of Geography and Travel—North America*; vol. ii., *The United States*, 1898, p. 368.

In 1890 the total area of the farms was 632,000,000 acres, of which 357,000,000 acres were improved land.

AGRICULTURE OF THE UNITED STATES, 1897.

Crop.	Acres.	Bushels per Acre.	Total Value of Crop.	
Indian Corn, . .	80,000,000	23·8	\$501,000,000	£100,200,000
Wheat,	39,500,000	13·4	428,000,000	85,600,000
Oats,	25,700,000	27·2	148,000,000	29,600,000
Hay,	42,400,000	...	401,000,000	80,200,000
Cotton,	23,300,000	...	319,000,000	63,800,000

Stock Raising.—The keeping of live stock is not only an incident in mixed farming, but in the states of the Prairie and the Great Plains forms a highly specialised industry by itself. Cattle ranching is pursued chiefly on the sub-arid area of the Great Plains—that vast stretch of country west of the fertile land, and reaching from Canada to the Gulf of Mexico. The cattle on these ranches are bred mainly for their value as beef, and, in passing eastward to the market, they are often fattened in the Prairie States before being slaughtered at the great meat-packing centres. No less than 1,365,000 square miles—mainly on the Great Plains—are utilised for cattle ranches exclusively.* Sheep are kept on the western plains also, mainly for food supply, but their number is relatively smaller. Sheep, for the production of wool, are pastured largely in the eastern states, just as milch cattle are kept mainly in the neighbourhood of the great centres of population.

The Prairie States, especially those in which the Indian corn yield is greatest, excel in rearing swine, or hogs, as they are always called in America; indeed, a great part of the maize crop is used for fattening swine for the great centres of pork packing in Omaha, Chicago, Cincinnati, and elsewhere.

The tendency throughout the whole country is to conduct farming operations on a very large scale, with a high degree of organisation, so that the small farmer, although able to make a comfortable livelihood in favourable districts, will never be able to compete successfully with the great trading organisations backed by large capital.

* *Statesman's Year Book—United States, 1899.*

ESTIMATE OF ANIMALS IN UNITED STATES (ROUND NUMBERS) 1897.*

	Number.	Value.	
Horses and Mules, . . .	16,500,000	\$545,000,000	£109,000,000
Milch cows, . . .	16,000,000	369,000,000	73,800,000
Other cattle, . . .	30,500,000	508,000,000	101,600,000
Sheep, . . .	37,000,000	67,000,000	13,400,000
Swine, . . .	40,600,000	166,000,000	33,200,000

Mining.—The mineral wealth of the United States is, perhaps, the greatest and most varied of any country in the world; it is already to a large extent exploited. Indeed, so rapid are the methods of extraction of valuable ores, and so keen is the competition in the production of the precious metals, that large areas of the country have been overrun, worked out, and abandoned as valueless, in situations which a more deliberate method of working might have rendered prosperous for many years. If, for example, there is gold in a district which the labour of 1000 men could extract in 50 years, it is most probable that before the end was reached some other mode of making a livelihood would have been devised, and the small community, gradually accustomed to the locality, would have been rendered permanent. But if 50,000 miners rush into the district and exhaust the mines in a single year, the land is doomed to be a perpetual wilderness, unless it should happen to have an exceptionally fertile soil, a rare thing in a mining region.

The distribution of minerals in the United States is of peculiar interest. The most easily worked fields containing the best coal are in the Appalachian Mountain district on the east, where petroleum, natural gas, and iron ore also abound. Hence the dense population which naturally clusters on the Atlantic seaboard is supplied with all the materials for developing extensive manufactures and inaugurating an export trade. On the other hand, in the uninhabited, and, for a long time, inaccessible mountains of the west, immense deposits of the precious metals were discovered. These rapidly attracted a population, and thus formed a second centre of wealth, trade, and industry. In some places, like California, the genial soil and climate have perpetuated, in agriculture, prosperity begun in precious metals; in others, like Nevada, the mines when exhausted left the land

* *U.S. Yearbook of the Department of Agriculture*, 1898. The year 1897 is chosen for comparison with the statistics of crops, which in 1898 were below the average.

desert. Between the eastern and the western centres of population railways had to be constructed in spite of immense natural difficulties, and these led settlers into the great agricultural lands which lay between. In many places mineral wealth in coal and iron has since been discovered, underlying the prairie lands, the utilisation of which is helping forward the transition from an agricultural to a manufacturing community. In the production of iron the United States now lead the world, having surpassed the United Kingdom a few years ago, while the production of coal also promises before many years to occupy the first place.

CHIEF METALLIC PRODUCTS OF UNITED STATES IN 1897.

	Amount.	Value.*	
Pig iron, . . . long tons,	9,650,000	\$95,100,000	£19,050,000
Silver, ozs.,	53,860,000	69,640,000	13,926,000
Gold, ozs.,	2,774,000	57,363,000	11,472,500
Copper, lbs.,	491,638,000	54,000,000	10,800,000
Lead, short tons,	208,000	14,900,000	2,980,000
Zinc, short tons,	100,000	8,500,000	1,700,000

CHIEF NON-METALLIC PRODUCTS OF UNITED STATES IN 1897.

	Amount.	Value.†	
Bituminous coal, short tons,	147,800,000	\$119,740,000	£23,948,000
Pennsylvania } anthracite, } long tons,	46,800,000	79,130,000	15,826,000
Petroleum, . . . barrels,	60,570,000	40,900,000	8,180,000
Building stone, . . . .	...	36,000,000	7,200,000
Natural gas, . . . . .	...	13,800,000	2,760,000

The total value of metallic and non-metallic minerals together in 1897 was \$632,000,000 or £126,400,000.

In the foregoing table the quantities are expressed in the units employed in America, which are even more inconsistent

* These values are calculated according to the price at Pennsylvania for iron, at New York for copper, lead, and zinc; and the coining value for gold and silver. In the case of silver the commercial value in 1897 was only \$32,300,000.

† These values are calculated on the spot, after the product is raised to the surface and prepared for sale, but before being put on the market.

and confused than the ordinary British system of weights, if that be possible. The *long ton* is the British ton of 20 cwts. = 2240 lbs.; the *short ton* contains 2000 lbs. The values are derived from the Report on the Mineral Resources of the United States published annually by the U.S. Geological Survey.

Coalfields.—Mines of gold and silver afford at best only temporary stimuli to the development of a country, while mines of coal and iron usually lead to permanent prosperity. Practically all the anthracite is derived from a few hundred square miles of country in the north-east of Pennsylvania, and that state also contributes more than one-third of all the bituminous coal produced. Ohio, West Virginia, and Alabama are the only other states situated on the Appalachian coalfield which produce over 5,000,000 tons of coal per annum, although smaller amounts are obtained in Maryland, Kentucky, Tennessee, and other eastern states. The next coalfield in importance lies east of the Mississippi and north of the Ohio, and the mines within it make Illinois rank next to Pennsylvania as a coal-producing state. Another great coalfield lies west of the Mississippi, and is worked extensively in Iowa and Kansas, and, to a lesser extent, in other States. All these coalfields are in rocks of the Carboniferous age, and are separated by a broad belt of country—on the Great Plains—from the coal and lignite found in the Cretaceous and Tertiary strata of the eastern part of the Great Plains, the Rocky Mountains, and the Pacific coast. These coals, usually of inferior quality, occur in a number of small separate basins, and are most largely mined in Colorado.

The iron manufacturing district is in the east; Pennsylvania smelts half the pig iron of the United States, while Ohio and Alabama account for most of the rest. The ores in the immediate localities are much less used than those brought from the southern shores of Lake Superior, where the states of Michigan, Wisconsin, and Minnesota share what is perhaps the largest deposit of hematite in the world. Other large supplies of fine ore are known, especially in Missouri, but not worked, because of the greater economy arising from the use of the mines farther east.

Petroleum.—Petroleum is obtained chiefly from the great oilfield of north-western Pennsylvania, and the neighbouring parts of New York and Ohio. Natural gas occurs in the same regions, and many factories in Pennsylvania, Indiana, and Ohio use natural gas as a motive power, although the supply is not likely to prove permanent, and some works have been obliged to return to coal.

Metals.—Colorado, Montana, and Utah produce most of the silver and lead ; California and Colorado yield most of the gold, although other western states and territories also supply a considerable proportion.

Copper is obtained most largely from the south-west of Montana, the Keweenaw peninsula, on the south shore of Lake Superior in Michigan, where the ore is native copper scattered through conglomerate, and from the territory of Arizona.

Manufactures.—As in other countries, the manufacturing centres of the United States lie on the coalfields, or in the neighbourhood of other great natural sources of power, such as Niagara Falls. If we include in manufacturing industries the felling and sawing of timber, and the slaughtering and packing of animals for food, the manufacturing industries of the United States greatly exceed in value those of any other country in the world. The fact that all but a small fraction of the manufactured goods are consumed in the country has helped to produce the impression, common in Europe, that American manufactures are trifling in amount compared with the production of raw materials. The total value of the product of all manufacturing industries in 1890 was \$9,372,000,000, or £1,874,000,000, and 4,700,000 hands were employed. The largest establishments are concentrated in the north-eastern states and in the neighbourhood of Chicago, so that in 1890 more than one-half of the establishments and of the capital were found in the states of New York, Pennsylvania, Ohio, Massachusetts, and Illinois. Here the organisation of labour and capital is more complete, and the struggle between them keener, than in any other part of the world ; competition increasing between the great firms engaged in the same industry until they are driven to coalesce, forming gigantic trusts or monopolies against which no new firm can by any possibility contend. The immense power wielded by these trusts enables them to control the legislature to such an extent as to secure themselves against competition from foreign sources. From this point of view the eastern states are less “new lands,” in the way of furnishing openings to the energies of outsiders, than the oldest or most despotic countries in Europe.

Only one-third of the annual crop of raw cotton is as yet manufactured in the United States ; but this is in large measure due to the well-established fact that a humid atmosphere is essential to rapid manufacture, and the air of the United States manufacturing districts is everywhere too dry. Another industry that has been very slow in developing is steel

shipbuilding. As a consequence, only 25 per cent. of the foreign trade of the country is carried under the American flag. The coasting trade and the navigation of the rivers are, however, reserved for vessels built and registered in the United States, no foreign ship being allowed to carry cargo from any United States seaport except to a foreign country.

People.—The original nucleus of the people was of English origin, with a very small Irish and Dutch admixture, but from the Declaration of Independence, in 1776, onwards, the new elements introduced have become more and more diverse, although they have rapidly fused into a new and wonderfully homogeneous American type, using the English language, and following fundamentally English laws. The attempt to class the United Kingdom and the United States together as “Anglo-Saxon” has recently acquired a certain amount of popularity; but the term is unsatisfactory. The British peoples themselves are only in part descended from the early German tribes, and the proportion of Anglo-Saxon blood of English origin in an average American must be small indeed. “English speaking” is the only accurate term of comprehension. Whatever the nationality of the immigrants, a member of the third generation is, as a rule, truly American, and free from the traditions of his grandfathers.

POPULATION OF UNITED STATES IN 1890.

Foreign born,	9,250,000
Native born whites of foreign parents,	11,014,000
Native born whites of native parents,	34,720,000
Native born coloured,	7,638,000

Classifying the foreign born according to nationality, the distribution at the census of 1890 was as follows:—

COUNTRIES OF ORIGIN OF FOREIGN BORN WHITES.

Germany,	2,785,000	Russia,†	330,000
Ireland,	1,871,000	Austria-Hungry,	304,000
Great Britain,	1,251,000	Italy,	182,000
Canada,*	981,000	France,	113,000
Scandinavia,†	933,000	Switzerland,	104,000

The foreign born have a tendency to concentrate in the large cities, and to follow industrial occupations. They are most numerous in the north and east. Germans congregate mainly in the states of New York, Illinois, Wisconsin, Pennsylvania

* And Newfoundland. † *i.e.*, Sweden, Norway, and Denmark.

‡ Including Poland.

and Ohio. The Irish usually remain in the eastern states, especially in New England, New York, and Pennsylvania, and preferably in the large towns. Natives of Great Britain are more widely spread, but still show a tendency to remain in the east; while the Scandinavians prefer the north-central and western states, their chief centres being in Minnesota, Illinois, and Wisconsin. The French Canadians (who make up the greater number of the immigrants from Canada) are, as a rule, confined to the states in the extreme north; they are most numerous in Massachusetts, Michigan, New York, and Maine. The native born of foreign parentage are very similarly distributed. Great migrations of the native born whites of native parentage have taken place from the eastern states to the west.

The south-eastern states receive few immigrants, but they are the home of most of the 7,470,000 persons of negro blood who were recorded by the census of 1890. The negro population is mainly employed on plantations, in small farming in the country, and in personal service in the towns, filling such posts as waiters, barbers, gardeners, house servants, &c. The negro is kept, as a class, apart—not allowed to travel in the same cars, or worship in the same church, as the white; and, although legally entitled to equal civil rights, he exercises no political influence even in states where more than half the population is “coloured.” In California, and to a less degree in other western states, Chinamen, to the number of about 100,000, supply most of the domestic service, and monopolise the laundry trade. The cheapness of Chinese labour has led to very determined efforts on the part of white wage-earners to exclude them from the country, and, thanks to the rigorous application of the laws prohibiting Chinese immigration, the number of the Chinese inhabitants has ceased to increase.

Many small reservations all over the western states are set apart for the native Indians, of whom there are about a quarter of a million. About 50,000 of these have abandoned their tribes and live amongst the whites. About 50,000 more occupy Indian Territory as “civilised tribes,” exercising the right of self-government, and secured in the possession of their land, which belongs to the tribes and not to individuals. But, although white men are not allowed to hold property in Indian Territory, the white population there is at least twice as numerous as the red. Many of the whites have married Indian women, and as “squaw men” are included in the tribes; the others are simply intruders, holding and working mineral lands or farms, and carrying on trade without any legal title.

The immigration into the United States, on the average, exceeded half a million persons per annum between 1891 and 1893, but had diminished to less than 220,000 in 1898. The character of the immigrants is less satisfactory than it used to be. A very large proportion now consists of illiterate people from southern Europe, of inferior type, and—a more serious grievance—willing to work for low wages. They tend to deteriorate the American character, and the feeling is increasing that the time has come when wholesale immigration should be checked, and the resources of the country reserved for its own inhabitants and their natural increase. Already there are laws excluding imbeciles, lunatics, criminals, and paupers, and immigrants who become a burden to the State within a year of landing are liable to be returned to their country of origin. Hundreds are sent back under these laws every year, the number so returned in 1887 having been 1880. It would not be surprising if within the next ten or twenty years immigration to the United States should be altogether stopped.

Settlement of the Country.—Restless energy, inventiveness, independence of all tradition, and an unexampled power of voluntary association and organisation characterise the people of the United States as a whole. The resources of the country are utilised with feverish haste, and the land is often left exhausted and useless. The settled area of the States is considered to be all the country containing a population of more than 2 to the square mile. In 1890 the settled area amounted to 1,947,000 square miles, or 64 per cent. of the country, if Alaska is excluded. There is now no unsettled land left east of the 100th meridian, except a little round the great lakes, a little in Florida and the Gulf States, and (technically, at least) Indian Territory. Very little land worth settling remains unoccupied.

Mr. H. Gannett, the chief geographer of the United States Geological Survey, points out how settlement is often a mere passing incident in the history of a region. In speaking of the growth of new towns he says* :—

“Again, many of these incipient towns die prematurely. Mining excitements give birth to numberless “cities” which perish when the mines become exhausted, or, from one reason or another, work on them is stopped. The oil regions of Pennsylvania contain many of those mushroom towns, which, from the failure of the oil wells, are now in a state of decay. All over the high plains of the Dakotas, Nebraska, Kansas, and Colorado

* *Stanford's Compendium of Geography and Travel—North America*, vol. ii. (1899), p. 162.

are the remains of "cities" which were started during the boom period of 1885 to 1888, and which were depopulated by the droughts of succeeding years. All over the west are deserted towns, monuments of departed placer diggings, or "played-out" quartz leads. The railroads, too, continue their quota of recent ruins. Every important railroad, during its construction, carried at its end a town—even a city in some cases. As the end of the road moves on the town follows it."

Government and Laws.—The United States form a Federal Republic, consisting, in 1899, of 45 States, three organised Territories, two unorganised Territories (Alaska and Indian Territory), as well as some island possessions. Theoretically, the Government of the States is a perfect democracy, every community from the township or county up to the State and the Union, as a whole, having the sole right of appointing not only its legislative, but also its executive, bodies. Party politics are so highly organised that the ordinary elector has merely to record his vote as he is told, according to the party to which he belongs. A class of professional politicians thus practically wields the chief influence, but it frequently happens that the great commercial monopolies control the politicians. Thus it is only in cases when the public conscience is deeply stirred, as was the case with regard to the abolition of slavery years ago, that the individual elector exercises his independent influence in the manner contemplated by the authors of the constitution.

Every State has a Governor and a Legislature of two houses, elected by the people and exercising control over all matters affecting the internal administration of that State. Each organised Territory has a similar legislature likewise elected by the people, but the Governor is appointed by the Government of the United States. Each State and each Territory has its own judiciary, and every State has also its own militia force under the command of the Governor. Alaska has at present a Governor appointed by the United States Government, without a legislature, and the General Government also manages the affairs of Indian Territory and of the District of Columbia, the latter being a small area containing the city of Washington, the Federal capital.

The diversity of laws in the various States is very great, and sometimes troublesome. The franchise in Colorado, Utah, and Wyoming is extended to women, in the other States it is restricted to men, all males over 21 having, as a rule, a vote, but in some an educational or (in Rhode Island only) a property

qualification is necessary. Although the States have no power to impose duties on trade, they have the right of legislating on certain commercial matters; the liquor trade, for example, is prohibited in some States, and very severely controlled in others. The laws of marriage and divorce differ greatly; in some States divorces are granted for the most trivial reasons. One State (Nevada) permits prize fighting. The diversity of laws often makes what is considered a harmless, or even praiseworthy, act in one State a misdemeanour in another, and *vice versa*. While the fully settled States are as loyally law-abiding as any country in Europe, in others, where racial hatred is strong, or the rough manners of the early mining camps survive, there are frequent appeals to the summary, though not always unjust, methods of "Judge Lynch."

The General Government of the United States consists, first, of an executive head, the President, and a Vice-President (who succeeds him in case of death), both of whom are elected for a term of four years, by an indirect vote of the people. The President appoints the heads of the departments forming a cabinet. Next, it consists of a Congress of two Houses, the House of Representatives and the Senate. The House of Representatives is elected for two years directly by the people, the number of representatives of each State being based on the population at the last census, so that there is a redistribution of seats every ten years. One representative for each 175,000 inhabitants was the ratio in 1890. The Senate consists of two senators for each State, elected by the legislature of that state, one-third of the senators retiring every two years, so that only one-third of the body changes at a time. The main difference between Congress and a Parliament on the British pattern, is that there is no dissolution of the House of Representatives, and the Ministers do not resign if the Government is defeated.

The General Government is not entitled to levy direct taxes, but it possesses the sole right to impose and collect duties on imports, and this is usually exercised to the full, as the United States are strongly Protectionist. All foreign productions which could possibly compete with native industries are heavily taxed. The General Government exercises control over the small standing army, the usual employment of which is police duty in the Territories and on the Indian reserves, of the navy, and of the Post-office; but the telegraph system is in the hands of private companies.

The judiciary of the United States comprises the Supreme Court, which is charged with considering all appeals against

State laws which may be considered to be contraventions of the constitution of the United States. There are also United States Courts which exercise sole jurisdiction in the Territories, and likewise take cognisance of all cases of contravention of the general laws of the United States. In addition to this each State possesses a judicial body, engaged in the investigation of all offences against the specific laws of that State.

Aliens and Naturalisation.—The Alien laws of the United States are directed mainly against the introduction of undesirable foreigners; but they have also a protective object as regards certain industries. The return of imbecile, criminal, diseased, and destitute aliens exemplifies the first object, the prohibition of any one entering the United States under contract to perform any work exemplifies the latter. There are, however, exceptions in the Contract Labour Law in favour of some classes of skilled labour required for the establishment of new industries, and also of artists, professional, and scientific men. Throughout the United States there prevails the most perfect liberty of opinion and belief, and all white men are placed on a footing of absolute equality before the law. In many of the states, however, even the suspicion of a remote intermixture of negro blood may produce uncomfortable results. In other respects likewise this equality is more apparent than real. The voluntary political associations and trade unions exact absolute obedience to instructions from headquarters, and it is often difficult to avoid joining such bodies without running the risk of being boycotted. It is not legally compulsory for a foreigner settling in the United States to become naturalised; but the laws of some States impose disabilities on aliens in the way of holding property, or engaging in certain kinds of work, and it is practically necessary to become a naturalised citizen before the full advantages can be enjoyed. Thus only citizens, or those who announce their intention of becoming citizens, are allowed to obtain possession of vacant public lands. The conditions necessary for citizenship are five years residence, and an oath before any supreme, district, or circuit court, declaring the intention to become an American citizen, renouncing any other allegiance, and renouncing any title of nobility. This oath must be made and registered at least two years before citizenship can be granted—i.e., at latest three years after commencing residence, if the citizenship is to be obtained at the earliest possible date. In some of the western States the franchise is conferred on aliens who have expressed their intention of becoming naturalised.

New Lands of the United States.—East of the hundredth meridian, for the most part, and east of the Mississippi altogether, the useful land of the United States is fully occupied, and is being utilised, if not already to the fullest extent possible, at least to the greatest extent which is profitable under the present circumstances. The eastern States are already old countries, with a dense population steadily pressing on the means of subsistence, and giving rise to keen competition in all departments of industry. About half a million acres of unoccupied land exist in Florida and the same amount in Michigan. West of the Mississippi, however, there were in July, 1898, no less than 719,100,000 acres of land in the possession of the General Government, and nearly 370,000,000 acres in Alaska. Altogether 48 per cent., or nearly one-half of the area of the United States, remains unappropriated. Of this, however, 145,000,000 acres are reserved from settlement, either permanently, as in the case of the national parks and the Indian reservations, or temporarily, as in the case of the reserved forest lands. Hence, excluding Alaska, practically the whole of which is available for appropriation, there are in the United States 574,000,000 acres, or 30 per cent. of the area, ready to be disposed of to any citizen who cares to take up the land. At present the whole of this property remains vested in the General Government, and not in the governments of the separate states. Texas is the one exception to this rule, as it retained, on entering the Union, the right to the public lands which it possessed as an independent republic. In the following table it is treated as not reserved nor open to settlement by the United States Government.

The distribution of the public domain is shown in the table on p. 137.*

This prodigious acreage of unappropriated lands—twelve times the entire area of the British Islands—is, unfortunately, for the most part, quite unfit for occupation. Some of it is uninhabitable from its great altitude and rocky soil, some from its Arctic climate (in Alaska), but the greater part is valueless, because of its aridity. The utility of such land is measured solely by the supply of water available for irrigation. Hence arises a peculiar difficulty, for each state has absolute control of its own water rights, but no control over the land, while the General Government holds the land, but can do nothing as to

* Adapted from the detailed table given in Dr. Max West's paper on "The Public Domain of the United States," in the *Year Book of the United States Department of Agriculture for 1898*, p. 326.

the water. There is consequently a demand in many quarters that the General Government should make over to the individual States all property in the land, so that irrigation work on a large scale could be carried on before the land is appropriated to private owners, as it is only on a large scale that irrigation can be profitably undertaken. Elaborate irrigation surveys have been carried out by the General Government, and an immense amount of legislation passed by the legislatures of the arid states defining water rights in order to obtain the maximum benefit from the streams without destroying their value to landowners in the same State on their lower courses.

THE PUBLIC LANDS OF THE UNITED STATES, 1898.

State.	Unappropriated and Unreserved.		Reserved.	Appropriated.
	Acres.	Per cent. of area.	Per cent. of area.	Per cent. of area.
Alaska,	370,000,000	100·00	...	...
Montana,	71,567,000	75·13	12·03	12·84
Nevada,	61,358,000	87·23	8·51	4·26
New Mexico,	54,550,000	69·76	10·69	19·55
Arizona,	51,735,000	71·07	21·12	7·81
Wyoming,	49,035,000	78·54	13·16	8·30
Idaho,	44,207,000	83·68	3·67	12·65
Utah,	43,870,000	83·43	10·37	6·20
California,	42,443,000	42·72	16·35	40·93
Colorado,	39,708,000	59·81	9·38	30·81
Oregon,	35,898,000	58·25	8·87	32·88
North Dakota,	20,574,000	45·82	6·79	47·39
Washington,	13,442,000	31·49	26·08	42·43
South Dakota,	12,784,000	26·55	23·09	50·36
Nebraska,	10,548,000	21·47	0·14	78·39
Oklahoma,	7,007,000	28·31	29·11	42·58
Minnesota,	5,720,000	11·07	9·64	79·29
Arkansas,	3,697,000	11·02	0·01	88·97
Florida,	1,757,000	4·98	0·06	94·96
Kansas,	1,061,000	2·02	1·89	96·09
Louisiana,	755,000	2·62	5·11	92·27
Alabama,	552,000	1·60	0·26	98·14
Michigan,	505,000	1·37	0·24	98·39
Missouri,	446,000	1·02	...	98·98
Wisconsin,	414,000	1·17	1·04	97·79
Mississippi,	384,000	1·29	...	98·71
Indian Territory, . . . .	...	..	100·00	...
Other States, . . . .	...	...	0·4	99·96
Total,	944,017,000	41·51	6·34	52·15

The total area which can be irrigated by the existing perennial water supply is calculated officially at 74,000,000 acres, but the process of irrigation must be slow and costly. A great many suitable sites for irrigation reservoirs have, in the meanwhile, been surveyed and reserved from settlement.

Most of the land which is fit, either naturally or by irrigation, for occupation, and is not included in any of the Indian or timber reservations has been surveyed and laid out in townships six miles square, arranged and subdivided into sections and quarter-sections as in Canada (p. 18). The township plan is, however, differently numbered, and two sections of one square mile each are devoted to the advancement of education. A considerable amount of public land has been disposed of by grants to railways, usually as alternate sections in a belt 40 miles wide, and these railway lands, although regarded in the above table as appropriated, are still available for settlement, and are to be obtained by purchase from the railway companies.

The unappropriated public lands are in many cases used without restriction for grazing, and their value is often deteriorated by over stocking. Regarding the western States and Territories, Dr. West gives the following estimate of the value of the unallotted public lands from the point of view of farming. From the point of view of mining, they have already been partly exhausted, and are still largely occupied, so that the prospect of future discoveries of great supplies of mineral wealth is not encouraging.

CHARACTER OF THE PUBLIC LANDS OF THE WEST, 1898.

Character of Land.	Amount in Acres.
Woodland and Forest,	124,300,000
Grazing land,	365,400,000
Desert,	69,000,000
Total,	558,700,000

The largest extent of woodland and forest is in Idaho, Montana, and Oregon, which average 20,000,000 acres each. There is none in Nebraska, Oklahoma, or South Dakota. Most of the grazing land is found in Montana, New Mexico, Nevada, and Wyoming, these four states accounting for one-half of the whole. Irrigation would convert these areas into agricultural land. Deserts, hopeless at present even for grazing, occur in five States in amounts ranging from 5,000,000 to 20,000,000 acres—these States being Nevada, California, Arizona, Utah, and Wyoming.

Acquisition of Public Lands.—The public lands fit for settlement are divided into two classes, which are valued at a minimum price of \$1.25 and \$2.50 per acre respectively. Formerly they might be sold at that rate by the agents of the General Government; but now they can only be entered under the homestead laws. The higher price is charged, as a rule, for the alternate sections in the belt of railroad land grants, and the lower price for land remote from railways. Under the homestead laws, any citizen or intending citizen is entitled to settle on 160 acres of the land valued at \$1.25, or on 80 acres of that valued at \$2.50, on condition of residing upon, cultivating, and improving it for five years, and paying fees for registration, &c. Special advantages are given by statute to settlers who have served as soldiers or sailors of the United States, and in some cases the period of occupation before the title is complete is reduced to one year.

Desert lands, "which will not without irrigation produce some agricultural crop," can be acquired in lots of 320 acres by resident citizens on payment of \$1.25 per acre, spending \$1 per acre per annum for three years in constructing irrigation works, or buying water rights, and cultivating one-eighth of the land.

The "Carey Act" of 1894 provided for the donation of 1,000,000 acres of arid land to each of the arid land States, on their submitting a plan showing a proposed scheme of irrigation. The patent of ownership is issued to the State or its assigns as the irrigation works are completed; but the State is not permitted to dispose of more than 160 acres of the irrigated land to any individual. In 1898 only two States had applied for such gifts.

It is absolutely essential that all purchases of land should be made through the Government or through the railway land agents, and then only after seeing the land, as many of the numerous private land companies are not trustworthy. No one inexperienced in the peculiar methods of prairie or arid land farming would have the slightest chance of making a livelihood on any of the western public lands now open to settlement. Some men have a genius for pioneer work, and find pleasure in acquiring, breaking in, and improving new farms only to sell them as improved lands, and move on further into the unoccupied region. People attracted by life on the borders of civilisation, with capital enough to buy a farm made by one of these pioneers, may easily make a livelihood.

It may be useful to deal briefly with each of the States and Territories containing large areas of public lands available for settlement, and to point out the peculiar conditions of each.

The Gulf States.—The almost tropical climate, and the large proportion of coloured people amongst the inhabitants of the States bordering the Gulf of Mexico, gives them quite a peculiar character. Agriculturally, cotton, sugar cane, and fruit are the most important products, but in Florida and Alabama there are great stretches of pine and cedar forest. A large proportion of these forest areas is vacant land, and there are also stretches of unclaimed swampy land on the coast, the drainage of which would be difficult.

Mississippi.—In the State of Mississippi some extremely rich land is vacant on the low ground bordering the great river; but the reason why it has not been taken up is the risk of disastrous inundations when the banks of the river, which flows above the general level of the country, burst during floods.

Alabama.—In the north of Alabama there is some unoccupied land on the rugged mountainous region in which the Appalachian chain terminates. The land is not productive agriculturally, but it may contain iron and coal, which proximity to the cotton fields would render valuable for future manufactures.

Florida.—Florida contains a quantity of low-lying pine land, and a vast extent of swamp, much of which is unsurveyed and even unexplored. The swamp lands have been granted to the State, and in many cases are of value on account of the beds of phosphate which they contain. Market gardening on a large scale—known as truck farming—and orange growing are the most remunerative forms of agriculture. Both, of course, require experienced management, and necessitate much expense when new land has to be laid out.

Texas.—Texas, the largest State in the Union, retains the management of its own public lands, the character of which varies from swamps on the coast, where drainage is the great difficulty, to arid deserts in the far west, where irrigation is essential. The mineral wealth of this State is comparatively unimportant. There is no other part of the United States where individuals and companies have been permitted to acquire such large areas of land, and by the expenditure of capital it has been made productive. Cattle and sheep ranching are the typical industries, and are still capable of great expansion. The absence of limitations as to the acquisition of land to homesteaders here, affords a peculiarly favourable field to farmers with considerable capital, as land in large quantities can be purchased from the State at prices from \$2 per acre as a minimum, with long credit for payment on the security of the land. The climate is peculiarly severe on account of the intense heat, due to its

latitude, and the sharp contrast of bitter cold produced by the "Northerners," or winds sweeping over the open plains from the north. The maximum and minimum shade temperatures recorded in Texas are quoted as 103° and -14° .

States of the Great Lakes.—The western States bordering the great lakes—Michigan, Wisconsin, and Minnesota—still contain a considerable proportion of unappropriated public lands, although naturally the best and most accessible portions have long been in private hands.

Michigan.—In Michigan there are about half a million acres vacant, mainly in the Upper Peninsula which lies between Lake Superior and Lake Michigan, and consisting chiefly of sandy soil partly covered with beech, birch, and maple forests. Some vacant land is also to be found in the northern part of the Lower Peninsula between Lakes Huron and Michigan, but here there is no unappropriated woodland. The land is of fair quality for agriculture, with a light soil, but, as is natural, the unoccupied part of the country is unfavourably situated as regards roads and railways.

Wisconsin.—Wisconsin contains nearly as much vacant land as Michigan, most of it being in the extreme north, bordering Lake Superior. It is woodland, covered for the most part with pine and hardwood forests, but a considerable amount of the area is swamp.

Minnesota.—This State, similar in character to western Ontario and Manitoba, although the scene of an extraordinarily rapid agricultural development, still contains nearly six million acres of public land, including some Indian reservations recently opened to settlement. The rich prairie lands are now only to be obtained by purchase at a good price; the districts available for new settlers are situated in the difficultly accessible northern region between the Red Lake and the Lake of the Woods. Half of the available land lies in the two counties of Beltrami and Itasca. A large part of this region is still unsurveyed and it is mainly covered with forest. In some parts there is good farming land which only lacks facility of transportation to render it valuable. A good deal of mineral wealth is believed to be contained in the unoccupied land. This is chiefly iron ore, but nickel occurs in the north-east of the State, and there are also indications of payable gold in Itasca county, and in the neighbourhood of the Lake of the Woods and Rainy Lake. As yet, however, gold mining has not attracted great attention.

The State is one with a great future before it on account of

its unusual combination of agricultural, forest, and mineral wealth.

The Central States.—The Great Plains from the Canadian frontier to Texas are occupied by the States of North and South Dakota, Nebraska, Kansas, Missouri, Arkansas, Oklahoma Territory, and Indian Territory. While the last named is reserved from settlement, and can only be legally settled by white men under the degrading condition of becoming “squaw men”—i.e., husbands of Indian women—there is a vast amount of land in all the others still available for any intending settler. Here, perhaps, more than in other new lands, not fortune but merely a hard living is what the average pioneer must expect. There is a large area of vacant public land on the plains, but towards the west the semi-arid belt makes agriculture useless without irrigation, and in nearly all the States large areas of the best river lands are at present reserved for Indians. A vast basin in which artesian wells can reach a copious subterranean water supply stretches for 500 miles from Manitoba through the Dakotas and far into Nebraska, and is sure in the near future to prove of the utmost value.

North Dakota.—North Dakota, in spite of its very rapid development in wheat growing, contains about 20,000,000 acres of public land, as well as 3,000,000 reserved for Indians. The portion of the valley of the Red River of the North, which falls to this State, may be said to be fully taken up by farms, and is well served by railways. The western portion of the State containing most of the unappropriated public land is too dry for anything but grazing, although the soil is fertile enough when water is available. East of the Missouri artesian water is largely and increasingly used, and it is expected that south of Bismarck a large area will ultimately be irrigated by these means. On account of the gentle slope of the land, and the deeply cut valleys of the Missouri and its tributaries, it is very difficult to obtain irrigation water from the rivers. The smaller tributaries flowing in from the north are, however, favourably situated for the formation of irrigation reservoirs, and in the future the neighbouring land will become valuable. Two trans-continental railways traversing the State from east to west provide ample means of communication.

South Dakota.—South Dakota contains about 12,000,000 acres of public land open for settlement, and nearly as much reserved for forests and Indians. The Indian reserves occupy the whole south of the state from the Missouri west almost to the Black Hills, and nearly every part of the immediate neighbourhood of

the Missouri is reserved. Only small blocks of public land remain in the part of the State east of the Missouri, and well served by railways. The Black Hills, a mining region containing extensive forest reserves, in the south-west, is also well supplied with railways entering from Nebraska. Most of the available public land is in the south-west, and in the centre between the Cheyenne and White Rivers. Water storage and the extension of artesian wells are the only means of making agriculture profitable in the greater part of the land still vacant in South Dakota.

Nebraska.—Nebraska contains about 10,000,000 acres of vacant public land, mainly in the north and north-west, and traversed by a railway. The soil is light and sandy, and, until irrigation can be practised, only useful for grazing. Irrigation works have, however, already been carried out to a considerable extent with much benefit to the country, while the natural water supply will admit of considerable extensions in this direction being made. Sugar beet has been cultivated with much success on the newly-irrigated ground, the amount of alkali in the soil acting prejudicially on other crops, until the excess has been removed by growing beets.

Kansas.—Kansas contains only 1,000,000 acres of available public land, most of it being in the extreme west of the State, and, as a rule, adapted only for pasture. The only water supply available for irrigation is the subterranean flow, which has to be raised by pumps. The amount available in this way is not well known, the published estimates differing greatly. The State has developed very rapidly, and is more closely covered with railways than any other so far west.

Arkansas.—Arkansas contains about 3,500,000 acres of available public land scattered throughout all parts of the state. In the east this vacant land is either timbered or swampy, in the south-west it is mostly swampy, but amongst the hills of the centre and north-west there is some well-watered agricultural land still to be obtained. The eastern half of the State is well served by railways, but in the west the means of communication remain very poorly developed.

Missouri.—Missouri now contains only about 400,000 acres of public lands open for settlement, and most of this is rough hilly timber land in the extreme south and south-west.

Oklahoma.—The portion of Indian Territory which was thrown open for settlement in 1889, and incorporated with the "No Man's Land" north of Texas as the Territory of Oklahoma, was so rapidly taken up that within a few months of the admission

of settlers all the best land had been appropriated. There remain about 7,000,000 acres, the vacant land being chiefly in the western portion which, in the days before the Territory was organised, acquired an undesirable white population, for whom the neighbouring states were too hot. Many tribes of wild Indians continue to occupy the Territory, and a considerable force of United States troops is required to keep order amongst them. The western part of the Territory lies in the arid region, and is fit only for grazing without irrigation; but there is good farming land about the centre, and a fair development of railways allows of comparatively easy access. In the south and east cotton is raised, while wheat is an important crop in the centre and to the north. The mineral resources of the Territory have not yet been satisfactorily investigated.

Cordilleran and Plateau States.—Of the States of New Mexico, Colorado, Arizona, Utah, and Nevada it is scarcely necessary to speak. They all contain vast areas of public land, but the conditions both of mining and of agriculture are such that a newcomer has very little chance of success. The variations in population of some of the states have been remarkable. In Nevada, for instance, the working of the silver mines, on which the prosperity of the greater part of the population depended, may be rendered unprofitable and stopped altogether by a comparatively small fall in the price of silver. The mineral wealth of the whole chain of the Cordillera is undoubtedly still very great; it has been for the most part ascertained by geological surveys, and its utilisation is a question rather of finance than of discovery.

Wyoming.—The more northern State of Wyoming is rich, like the rest in mineral resources, but the coal, iron, and petroleum here found promise steady and permanent prosperity when they are fully exploited. The agricultural land lies at a higher elevation than in any other State—from 3500 to 7000 feet above the sea, and irrigation is almost everywhere necessary. Public works on an immense scale exist already for this purpose, and the natural water supply is sufficient to provide for a great extension in the future. The climate is very severe in winter on account of the great altitude. As a State, Wyoming is peculiar in having introduced and retained universal suffrage, women being on exact political equality with men.

Idaho.—Only 16 per cent. of the surface of the State of Idaho is in private hands. The greater part consists, however, of rugged mountains, largely forest clad, and of lava plains, on

which only the sage bush grows. There is a good deal of grazing land, but agriculture depends practically everywhere on irrigation. Farming without an artificial water supply is, nevertheless, possible in the extreme north, near the Canadian frontier. In this region, also, there is probably a great future to be looked for in the development of mineral resources.

Montana.—Montana still has three-quarters of its surface available in the form of vacant public lands, but most of this area is forest-covered mountains and arid plains, which are still unsurveyed. The resources of the land are only beginning to be developed, but enough is known of them to ensure a prosperous future for the State as a whole. Mining and cattle raising are the most profitable pursuits at present, the small rainfall rendering agriculture unsatisfactory over most of the state. There are great possibilities for irrigation, but much capital must be invested before any return can be expected from this direction. The valleys of the Missouri and Yellowstone cross the state from west to east, and along them two trans-continental railways supply an excellent basis for opening up the country.

The Pacific States.—The three States on the Pacific slope are thinly peopled, and all contain wide areas of vacant land, the greater part of which is never likely to be occupied.

California.—California exhibits many varieties of climate and soil. The immensely fertile valley between the Sierra Nevada and the Coast Ranges may be said to be now as fully occupied as economic conditions permit. The alluvial gold deposits which attracted people to the country are exhausted, and the precious metals can now be worked only by expensive machinery, and on a large scale. The arid region is mostly a hopeless desert, and only a fraction of it can ever be reclaimed to agriculture by costly irrigation works. In fact, while a living can be made in California as in most other States, it is no longer a region to attract the foreign immigrant who looks forward to more than bare sustenance.

Oregon.—Oregon, to the north, is in a far less developed condition. The coast strip, and the wide valley between the Coast Range and the Cascade Mountains, through which the Willamette River runs northward, are well watered by a copious rainfall, and, although these are the best settled regions, some vacant public land can still be found in them. The counties of Clackamas and Marion in the north, and of Douglas and Coos in the south, contain most of the vacant land, and lie in the central valley, which contains the main north and south railway lines from California to the Columbia River. Outside

this valley the railway system is still undeveloped. The moderately elevated plateau east of the Cascade Range contains much vacant farming land, which can be cultivated without irrigation, although with some risk of failure through deficient rainfall. The north-eastern part of Oregon is very fertile wheat land, and there has been a great development of wheat growing, leading to the cultivation of great areas of land formerly devoted to grazing. There are extensive fisheries on the coast, although it is exposed and dangerous. Mining is being greatly developed both for coal and iron and for the precious metals.

Washington.—Washington shares the mild climate of Oregon and British Columbia, between which it lies, and although the area of available public land is less than in Oregon, the resources of the two States are very similar. Washington grows large quantities of wheat on the eastern plateau without irrigation; but irrigation is necessary for the successful growth of fruit and succulent crops, except, of course, on the coast belt. There is a practically inexhaustible supply of timber on the mountains, and the mineral wealth of the State, which is being actively developed, promises to support a very large population. The coal mines are the most productive in the west of the United States, and iron is also mined and manufactured. There has recently been a great increase in gold mining and smelting, and the railway facilities have brought nearly all parts of the state within easy reach of the centres of population. The fisheries on the quiet waters of Puget Sound are of great value. Washington State is perhaps, at the present time, the part of the United States best worth the attention of an intending settler.

ALASKA.

Position and Area.—The outlying Territory of Alaska must be treated separately from the rest of the United States, on account of its distance and isolation, its nearly unexplored character, and the opportunities it affords for adventurous and tough pioneers. Although at present outshone by the gold-bearing lands of the Upper Yukon, the lower valley of that river undoubtedly contains gold in large amount, and as attention is fully turned towards it, important discoveries are likely to be made in the Territory for many years to come.

Alaska has an area estimated at 580,000 square miles. It comprises a narrow strip of the west coast of North America from Dixon Entrance in 54° 30' N. (the boundary of which is

still unsettled, see p. 30), the whole north-western peninsula west of the meridian of 141° W., and the long chain of the Aleutian Islands. About one-third of the area lies north of the Arctic circle. The coast is very mountainous in the south-east, and the lofty snow-covered ranges send down enormous glaciers to the sea. Mountainous islands rising abruptly from the water form an archipelago along the shore, and the channels separating them provide a great length of smooth-water navigation, although traversed by powerful tidal currents.

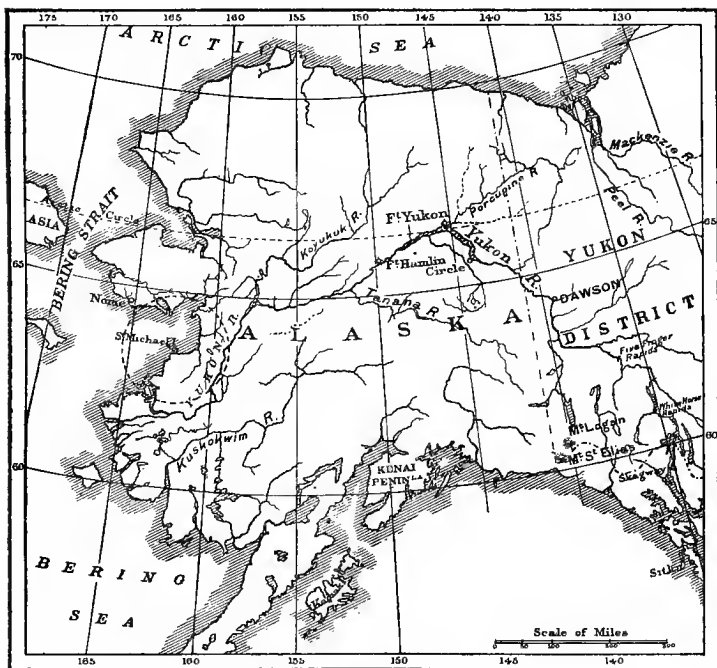


Fig. 4.—Alaska and Western Yukon.

Administration and Laws.—The whole Territory is administered by officials appointed by the United States Government, but as parts of the country are becoming filled by gold-seekers, temporary centres of administration are occasionally established, and the regulations imposed by the central authority undergo

considerable changes. It would thus be well for anyone entering the territory to ascertain beforehand the actual conditions prevailing at the time. The laws in force in Alaska are those which prevailed in the State of Oregon in 1894, the mining laws being those of the United States as a whole. Citizens of the Dominion of Canada are accorded the same rights in Alaska, as citizens of the United States receive in British Columbia and the North-West Territories. Homesteads of 40 acres, or in exceptional cases of 160 acres, are granted to citizens or intending citizens of the United States, but there are few parts of the territory where the natural conditions offer attractions to settlers. The importation of spirituous liquors into the territory is formally prohibited, but this law is absolutely ignored by the miners and prospectors who have been crowding into the country during the last few years. Post offices were established by the United States Government in 1898 at Eagle, at the mouth of Missouri Creek; Star, at the mouth of Seventy-mile Creek; Yukon, at Fort Yukon; Rampart, at the mouth of the Minook Creek; Tanana, opposite the mouth of the Tanana River; Koyukuk and Anvik, at the mouths of the rivers of the same name. A fortnightly mail has been established along the whole Yukon Valley, but for a month in spring, when the river is thawing, and for another in autumn, when it is freezing, all travelling becomes impossible.

Ports and Communications.—The Territory may be divided into three distinct parts:—(1) The Unalaska Peninsula, the Aleutian Islands, and islands in Bering Sea; (2) the southeastern coast strip, or “pan handle,” as it is familiarly called, and its off-lying islands; and (3) the main body of the Territory through which the Yukon River flows. The whole region is in communication with San Francisco, and with Seattle and other Puget Sound ports by monthly mail steamers, and during the present gold excitement by a great fleet of coasting steamers of all sizes and qualities, for the entrance to the Klondike region of Canada lies through Alaska.

The administrative capital of the Territory is Sitka, on one of the islands lying off the “pan-handle,” but it is far surpassed in population by the mushroom towns which have arisen in consequence of the rush to the goldfields. Of these Skagway, at the head of one of the arms of the Lynn Canal and the terminus of the White Pass Railway, is the chief, its possession is conceded to the United States by the *modus vivendi* on the Alaskan boundary question arrived at in October, 1899. The next terminal town of importance is Fort St. Michael, on Bering

Sea, the point for the transfer of cargo and passengers from ocean steamers to river steamers of sufficiently light draught to enter the shallow channels of the Yukon Delta. It has been made the centre of a military reservation, which extends for a radius of 100 miles. The river steamers run, while the river is open, for 1380 miles to Circle City, not far from the frontier, and on for nearly 200 miles farther to Dawson, in the Canadian Yukon. New ports have naturally arisen wherever there is a convenient place for prospectors to enter on a promising route.

Climate.—The climate of Alaska has a worse name than it deserves, but it is on the whole very severe. On the south and west coasts and in the islands it is favourably modified by the influence of the sea; but in the Yukon Valley and the interior generally the winters are of Arctic severity, and night frosts occur in every month of the year. The soil is frozen to a depth of about 100 feet in the valley, and only the superficial layers thaw in summer. The actual temperatures may be quoted as follows:—* At Sitka the average temperature of the warmest month, August, is 54.9° , and that of the coldest, January, only 31.4° , while the extreme temperatures recorded during 45 years have been a maximum of 88° and a minimum of -4° . This is a climate scarcely colder on the average than that of Shetland or Orkney, although the extreme range is far greater. At Point Barrow, on the Arctic Sea, the average temperature of July, the warmest month, appears to be about 38° , and that of February, the coldest month -18.6° ; while the extremes observed have been -52° and $+65.5^{\circ}$. Snow lies from September to June. At St. Michael the climate is much less severe than at Point Barrow, but minima have been recorded as low as -55° , and the harbour is usually closed by ice in the middle of October, and does not open again until about the middle of the second week of June. Light rain or snow is very frequent, although the total amount is small. The following data are calculated as the average temperatures for the three coldest winter months—December, January, and February—at different points in the Yukon Valley:—

* From "Climatic Conditions of Alaska," by General Greely, in *National Geographic Magazine*, vol. ix. (1898), p. 132.

Place.	Latitude.	Longitude.	Temperature.
St. Michael,	63° 28' N.	162° W.	3·3° F.
Anvik,	62° 37'	160°	- 1·2°
Circle,	65° 30'	143°	- 10·2°
Dawson,	64° 5'	138°	- 24°

Possibility of Agriculture.—The Yukon Valley is well wooded with spruce and other trees, though, as a rule, of rather stunted growth, and the land, where not covered with trees, bears moss and berries of various kinds. The soil is in many places a vegetable mould, but often it takes the form of peat. The growth of grain is possible only in a few favoured spots; but vegetables can, with great care, be grown almost anywhere in the Yukon Valley. The quality is, of course, not to be compared with that of plants reared in a genial climate, and the whole crop will be lost occasionally, despite all precautions; yet, during the mining “boom,” it is probable that a well-cultivated vegetable garden, with some glass for protection from frost, would prove a more certain source of income than gold mining. Vegetable gardening has been found to be successful at Dawson.*

Resources.—The old industry of the country was hunting and trapping, and the Hudson Bay Company carried on a remunerative trade in furs for many years. The fur-seal trade still proves profitable to one company on Pribyloff Islands, but this does not admit of expansion, and is a monopoly with which there can be no competition. Fishing and the canning of salmon already flourish at several points on the coast, and they are capable of great development. However, all the resources of the territory sink into insignificance when compared with mining, and especially gold mining. When the present excitement dies away there will be steady work for a large number of people in the gold mines for many years to come, although during the “rush” much suffering and privation are inevitable. Thousands have pushed their way into parts of the country where only hundreds can make a living, and the life of prospectors in that Arctic climate is a very hard one, and, even when the men are skilful in noting the signs of the presence of the precious metal, precarious.

The following outline of the mineral resources is based on a

* *Bulletin of the Department of Labour, Washington, 1898 (No. 19), p. 799.*

report by S. F. Emmons, of the United States Geological Survey,* with the addition of more recent information :—

Gold in Alaska.—Vein deposits of gold are mined in many parts of south-eastern Alaska. The principal quartz deposits occur in a belt of country about 100 miles wide on the seaward slope of the mainland, reaching from Sumdum on the south-east, past Juneau to Berner's Bay, near Seward on the north-west. Deposits also occur in several of the islands—*e.g.*, Kadiak, Baranof, and Unga Islands. They are found in metamorphic slates, diabases, and granites similar to those of the auriferous belt of California. The land is, however, so densely wooded that prospecting in the coast region is extremely difficult. In many places auriferous sand occurs on the sea shore, probably obtained from the weathering of the gold-bearing rock of the country. The mines of Unga Island are worked, and worked very profitably, in eruptive andesites of Tertiary age, a fact which points to the possible discovery of payable quantities in the recent eruptive rocks which make up the Unalaska Peninsula and the Aleutian Islands.

In the Yukon Basin the gold appears to be derived from much more ancient rocks, possibly as old as the Archæan. These older auriferous rocks have been found by the U.S. geological surveyors to extend over a belt of country running for 500 miles in a north-west and south-east direction, but it is probably much more extensive to the north. The Gold Belt of the Yukon Valley is known to extend from about the point where the meridian of 155° W. crosses the river Yukon east-south-eastward up the Tanana River, and over the frontier (141° W.) into Canadian territory. It may extend southward to the high region, where Mount MacKinlay stands, near the sources of the scarcely explored rivers, Kuskokwim and Sushitna. Along the Yukon itself, from Fort Hamlin to near Circle City (200 miles, disregarding windings), the river flows through a flat alluvial valley, in which no outcrops of solid rock occur; but nearer the international boundary the two tributaries from the south (Forty-mile and Sixty-mile Creeks), which enter in Canadian territory, have a long course through the gold-bearing rocks in Alaska.

Naturally in a new region gold is mainly worked by placer-mining in the alluvium of the rivers. The richest placers of the Yukon Valley have been found on the Forty-mile Creek

* "Alaska and its Mineral Resources," by Samuel Franklin Emmons. Published as a pamphlet by the United States Geological Survey and in abstract in *National Geographic Magazine*, vol. ix. (1898), p. 139.

near the boundary, and on Birch Creek, which flows parallel to the Yukon from south of Circle City, and enters that river in its great curve midway between Circle City and Fort Hamlin. The pay gravels lie either on clay or on the decomposed bed-rock, under from 8 to 25 feet of barren gravel, and the character of the deposit indicates that the gold-bearing rocks are not far off. Gold is found, but too finely divided to be profitably extracted, in the fine silts deposited on the margins of the Yukon and its tributaries during floods, and also in paying quantities in the sand or gravel bars laid down on the concave side of river windings. The river beds themselves, doubtless, also contain much gold. The terrace gravels deposited at various elevations high above the present river levels have not hitherto proved very productive in this region.

The diligent prospecting of recent years in all parts of Alaska has resulted in the discovery of the existence of gold in almost every river of the Territory, from the Arctic Sea to the Pacific Ocean; but the only place where anything promising an approach to the richness of the Klondike region has been discovered is at Cape Nome.

Cape Nome Goldfields.*—Late in 1898 a goldfield was discovered near Cape Nome on Bering Sea, and the workings in the summer of 1899 caused a very large camp to collect, and Nome City arose at the mouth of Snake River, 100 miles north-west of St. Michael, and outside the military reservation. The neighbouring country is barren tundra, with no trees and only a little grass. The nearest harbours which ocean-going vessels can enter are Port Clarence, 60 miles to the north-west, and Golofnin Bay, 60 miles south-east. The tundra is covered with marine gravels derived from the mountains, which consist of mica-schist and limestones, traversed by quartz veins, the probable source of the gold. The margins of the creeks, falling into the rivers of the district, yield a good return of gold; but the special feature of the new field, which will probably make it a serious rival to Dawson, consists of the beach diggings, which extend already for 30 miles along the shore. Some of them can only be worked at low tide, and as it is practically impossible (if not illegal) to stake out claims between tide marks, the liveliest competition is assured at each ebb. The gold on the beach is found lying on a "bed rock" of clay or argillaceous sand, covered by from 2 to 3 feet of gravel. Gold dredging at sea has been introduced with some probability of success.

* F. C. Schrader on "Cape Nome Goldfields," in *National Geographic Magazine*, vol. xi. (1900), p. 15.

Coal.—Scarcely less important than gold in such a region as Alaska is the supply of mineral fuel, and both coal and lignite are widely distributed, promising abundant supplies for the steamers, and for running machinery when quartz mining is established in the interior.

Strata of lignite and glance coal have been reported, and occasionally worked in many parts of the territory. They occur in most of the islands of the Alexander Archipelago, and on the coast of the mainland. The largest lignite field yet known is on the eastern shore of Cook Inlet, in the Kenai Peninsula. It extends over an area of 70 miles by 30; and one good harbour, Kachemak Bay, affords a possibility of shipping fuel. At this bay six or seven seams are exposed, the thickest measuring 4 feet. The Unalaska Peninsula, and the nearer Aleutian Islands, contain coal which has been tested at the harbours of Amalik, in Unga Island, Chignik Bay, on the southern, and Herendeen Bay, on the northern shore of the peninsula. Deposits occur at intervals along the west coast north of the Yukon, in Norton Bay, on the Kowak River, and particularly along the 25 miles of coast between Cape Lisburne and Cape Beaufort, where the whalers commonly fill their bunkers. Along the course of the Yukon River, coal has been seen at Andreafski, Kaltag, Nulato, and Melozikakat, and at Coal Creek, near the Lower Ramparts, it has been mined for the use of steamers. There seems to be a considerable development of coal along the north slope of the Yukon Valley, although but little attention has as yet been paid to it. The usual fuel on the river steamers has hitherto been wood, but every year the supply of firewood is becoming more difficult and costly to procure, and the opening of the coal mines on a commercial scale is now practically necessary.

CHAPTER VIII.

LATIN AMERICA—MEXICO.

Latin American Republics—Bureau of American Republics—Religion—Immigration—Communications—Why South America is Neglected. Mexico—Surface and Climate—Resources—Railways—People—Government—Prospects for Development.

Latin American Republics.—The continent of South America and the southern part of North America may be conveniently grouped together as Latin America, for they have been occupied and, to a certain extent, developed by Latin races, speaking the Spanish or Portuguese language. Except for the colonies of British Honduras, and of British, Dutch, and French Guiana, the whole region is occupied by republics, the constitutions of which are, as a rule, modelled on that of the United States. The written constitutions do not, however, convey any idea of the actual conditions of government or administration. Most of the republics are prosperous only when the presidency is held by a Dictator who rules rather as an autocratic monarch than the head of a constitutional state. Revolutions of a sanguinary kind have been frequent in all the republics situated in the tropical zone, and severe political crises, disquieting alike to commerce and peaceful industry, are common throughout the whole of Latin America. Most of the republics have contracted heavy debts, frequently raising money for important public works, and spending it in carrying on useless and indecisive wars, so that the national credit has been shaken. The better classes of the inhabitants are of Spanish or Portuguese descent, but the majority of the population is made up of Mestizos, or half-breeds between Europeans and the native Indians; while in many of the republics there are large numbers of pure bred aborigines, and negroes descended from imported slaves.

Bureau of American Republics.—Commercially, Latin America has hitherto had more intimate relations with the trading nations of Europe than with the United States; but North American influence is steadily growing. This is fostered by

a quasi-political organisation termed the Bureau of American Republics, the headquarters of which are in Washington under the direction of an American statesman appointed by the United States Government. This Bureau is concerned with the collection and publication of data bearing on the individual republics, and it is to be hoped that by means of its influence the less responsible Central and South American States will become more systematic and trustworthy in their administration, and in their statistics, than has been the case hitherto. Application for information may be made to the Bureau of American Republics, Washington, D.C., United States, and lists of the publications of the Bureau will be sent on application. The largest of these works is an immense Directory giving the names of the chief merchants and business men in every one of the states of Latin America.

Religion.—Throughout Latin America the Roman Catholic Church is almost the only representative of Christianity, but, while in most, although not yet in all the republics, other beliefs are tolerated, the power of an ignorant priesthood over a more ignorant people is everywhere a barrier to development.

Immigration.—The temperate portions of these republics attract a considerable amount of immigration, but the people come mainly from southern Europe, especially Italy. The best of the colonists from the south of Europe are the Basques, who come from the western borders of the Pyrenees in France and Spain. Recently, however, German emigration has been directed to South America, and the influence of a strong, well educated, and energetic northern people is making itself felt in the growth of industries in the regions where they have settled.

For purposes of foreign trade the metric system of weights and measures is used in all the republics, but in several there are older units in use for domestic purposes. The coinage is, as a rule, silver, but paper is the common currency in most of the countries, and is always very much depreciated.

Communications.—All towns of importance in South America are included in the telegraph system which festoons the coast with submarine cables as far south as the River Plate and Valparaiso, and is connected with the United States, the United Kingdom direct, Spain and France.

There are only three first-class seaports—Rio de Janeiro, doing most of the oversea trade of Brazil; Buenos Aires, receiving the trade not only of the Argentine, but of all the other republics reached through the River Plate; and Valparaiso in Chile, the one large seaport on the west coast. The West

Indies are reached by several lines of steamers from United States and British ports, which touch at a great number of ports in the islands and on the Caribbean Sea. Communication with South America is kept up by a number of European lines of first-class passenger steamers, British, French, and Italian. These call, as a rule, at ports in Brazil, in the River Plate, and then go through Magellan Strait, or Strait le Maire to Valparaiso.

Why South America is neglected.—The natural resources of all the republics are vast and but little exploited. Physical conditions are not unfavourable on the whole; the great rivers afford water communication throughout the interior of the entire continent of South America; the lofty plateaux carry a temperate climate into the Torrid Zone, and the soil is remarkably productive, except in the shingle deserts of Patagonia and the nitrate deserts of the west coast. Yet the social and political state of many of the republics is an absolute bar to any economic development; there is no guarantee for security of property, or even of life, in some of the countries. A corrupt administration and a dilatory officialdom are sufficient to wear out the patience of the most enterprising, and there are good grounds for the warnings of the British and United States consuls to their fellow-countrymen proceeding to South America with a view to settlement. Next to a reformed political system, what most of the republics of Latin America most need is a population of energetic workers, and the partial recognition of this requirement has led to efforts being made to induce immigration, while the ignorance of the first and greater need prevents the possibility of success in this direction.

Here we consider it advisable to refer only to the republics of Mexico, Argentina, Chile, and the southern states of Brazil, as in these alone are the conditions of climate and the stability of government such as to justify the development of the country by the individual efforts of people of English speech.

THE REPUBLIC OF MEXICO.

Surface and Climate.—Mexico occupies the lofty triangular tableland south of the United States, and part of the lower lands of Central America. The whole area of the country is about 767,000 square miles, and from its position, between latitudes 32° and 15° N., the climate is fairly uniform from north to south; but changes completely from sea level to higher altitudes. Along the sea shore, and up to the elevation of about 3000 feet, the climate is very hot, and this zone, called

the *Tierra Caliente*, or hot land, is unhealthy, especially on the coast of the Gulf of Mexico. The much larger area between 3000 and 5000 feet above sea level, forming part of the top of the plateau, is known as the *Tierra Templada*, or temperate land, and enjoys a very pleasant climate. Above 7000 feet comes the smaller area of the *Tierra Fria*, or cold land, unfit for habitation. There is no winter in the ordinary sense of the word, but the year is divided into a rainy season (from about May to October) and a dry season, which is very dry indeed.

Resources.—The hot zone produces all tropical vegetation in luxuriance, the coffee plantations forming one of the chief resources of the country. The temperate land yields all the farm crops of temperate countries, although the methods of farming in use are extremely primitive, and the roads very bad, so that transport to the towns is both difficult and costly. The main wealth of the country has always been the silver mines, the output of which, although enormous, is still capable of being increased. Vast and scarcely touched deposits of gold and other valuable minerals await development.

Railways.—The main outlines of a railway system have been constructed. Lines converge on Mexico City in the south of the plateau from several points on the United States frontier, so that the capital may be reached by through lines from San Francisco on the west, Denver and other towns on the north, and, through New Orleans, from all parts of the south and east of the States. The chief port on the Gulf of Mexico, the fever haunted town of Vera Cruz, has two railways of about 220 miles, leading up the steep slopes of the *Tierra Caliente* to Mexico City. Tampico, farther north on the Gulf coast, 450 miles by rail from Mexico City, has a better harbour, and appears likely before long to absorb most of the maritime trade. Lines from the capital are intended ultimately to lead to several of the Pacific ports, including the fine harbour of Acapulco; but none is yet completed, on account of the great engineering difficulties presented by the steep western slope of the plateau. The only railway in the republic which connects the two oceans is that across the isthmus of Tehuantepec. The most isolated parts of non-tropical Mexico are the long peninsula of Lower California and the marvellously rich mineral districts skirting the Pacific coast.

People.—The population of Mexico in 1895 was 12,500,000, or about 16 per square mile. Its composition is important from the point of view of the economic development of the country. Only 19 per cent are of pure European descent

(mainly Spanish), and 38 per cent. are of pure aboriginal "Indian" race, the remaining 43 per cent. being of mixed race. It is noticeable, however, that the educated Mexican Indian is the equal of the white man in ability, even as a statesman or soldier, and there is little or no race-prejudice. The preponderance of the uneducated aboriginal and mixed elements largely accounts for the backwardness of the country in regard to sanitation, agriculture, and means of transport.

Practically the whole population is Roman Catholic, but the Church is entirely separate from the State, which has appropriated a great deal of the old endowments, and there is complete toleration for all religions. Still, the frequent feasts and fasts combine with the leisurely manners of a Southern people to make business of every kind move very slowly. Spanish is the language of commerce and of daily life, and it is necessary for any one who has to do business in the country to understand it. Formerly much more of the trade was in English hands than is now the case. The Germans and the southern French (usually termed *Barcelonnettes* from their Spanish port of shipment) now share most of the import trade from Europe; while Americans from the United States, on account of their proximity, have taken a lead in mining and railway work.

The currency of Mexico is silver, and the value of the dollar fluctuates about two shillings, being less than half its nominal value. Banking is but little developed, and the exchange of money between the capital and outlying towns is troublesome and expensive. The Custom-house at Mexican ports has a bad name for exactions and delays, aggravating a tariff which of itself is discouraging to trade.

Government.—The government of Mexico is that of a federal republic on the model of the United States. There are twenty-seven States, each possessing complete local self-government, two Territories (Lower California and Tepic on the west coast) and the Federal District, which includes the capital. There is a Congress and Senate for national legislation, as in the United States, and a President elected by the people for four years. Unlike the United States, however, Mexican law allows of repeated re-election, and, as a matter of fact, one president—General Porfirio Diaz—has been continually in power for over twenty years. His reign—for it fully deserves such a designation—has led to the relative state of advancement in which Mexico stands; but, as in all Latin republics, it is impossible to predict what may happen when he can no longer fill the office.

Prospects for Development.—The Mexican government has at various times offered great inducements to immigration, such as freedom from taxes and from military service, facilities in obtaining land, and even assisted passages, but the result has not been very satisfactory. The prospects of English-speaking people in Mexico are well summarised by Señor Romero, the Mexican Minister at Washington.* He points out that the low wages consequent on the existence of a large aboriginal population renders it impossible for white labourers to make a living. There is, in fact, more labour than the present state of development of the country requires. Capital, and the intelligence to utilise it advantageously, are wanted now. Señor Romero says:—

“What Mexico needs is capital to develop her resources and give employment to labour, and then immigration will flow in as naturally as water seeks its level. Mexican credit will be established, so far as immigration is concerned, when her natural resources are developed, this being the only safe and reliable basis of such credit; and this will never be developed until those who have capital to invest are acquainted with the unparalleled opportunities for safe and profitable investment in Mexico. This will only be accomplished by plain, blunt, matter-of-fact, and well-informed press agents, who lay before people who have money to invest the plain facts of the case.”

Frankly pointing out the great difficulties which the American (and still more the European) settler would experience in Mexico on account of the different language and habits of the people, the unhealthiness of the hot lands, and the difficulty of obtaining public lands (which are still unsurveyed for the most part), or in purchasing land from the present proprietors, Señor Romero comes to the conclusion that for the man who looks to his day's pay for his living, Mexico is not the place in which to settle. But he considers that for a farmer of the New England or Middle States type, who will raise a little of everything, combining market-gardening with farming, there is an opening in temperate Mexico, provided that he has a capital of a few hundred pounds (which is worth double its sterling value in Mexico), and can afford to visit the country and look round a little before deciding where to settle. He warns the settler, however, that it is not likely that his northern energy will stimulate his native neighbours to more active ways, but extremely probable that the

* *Geographical and Statistical Notes on Mexico* (New York and London: Putman's Sons. 1898).

easy Mexican manner of life will grow upon the newcomer, and reduce his aptitude and inclination for work.

It is to the mineral resources of the country that the energies of foreign immigrants with capital can be most profitably directed, and concerning these the views of the Mexican Minister are much more encouraging. He says:—

“In mining Mexico offers inducements superior to any other country; and whether a man has a thousand dollars or a million he can go there and make more, if he exercises ordinary precaution and judgment, and if he makes up his mind to stand the discomforts of the country. It is a good country for the prospector, too, because there are no seasons against him, and there are many new fields entirely untouched; but he needs money enough to get there with, and enable him to obtain the proper kind of outfit, and time to familiarise himself with the requirements of the law, and select some district in which he wants to operate.

“For the small capitalist, or for a small syndicate, there is no finer field for the organising of small companies for the purposes of opening and working old abandoned mines, which are filled with débris or water, and which it will pay to clean out and work, and of which there are still many to be had. In times gone by they were abandoned, because of the refractory condition of the ores, or lack of machinery, or want of transportation, all of which conditions have been removed. There is also a fine opening for capital for the exploration of the new goldfields in the vicinity of Guadalupe y Calvo, in the range between Sonora and Chihuahua, in the State of Guerrero, and in many other localities.”

A British subject wishing information regarding the commercial condition of any part of Mexico should apply to the British consular officer, situated in the nearest town to the district in question; or if on Mexico, as a whole, to the Consul in the capital. It would be wise, in any case, before entering into engagements with strangers as to properties or enterprises in Mexico, to ask the opinion of the Consul. A British Consul resides in Mexico and in Vera Cruz, and there is a British vice-consul at each of the following towns:—Acapulco, Chihuahua, Ciudad Porfirio Diaz, Guaymas and Sta. Rosalia, Mazatlan, Monterey, San Blas and Tepic, Soconusco, Tampico, Coatzacoalcos, Frontera, Laguna de Terminos, Progreso and Campeche, and Taxpam.

CHAPTER IX.

LATIN AMERICA—TEMPERATE BRAZIL AND CHILE.

Brazil—United States of Brazil—People and Resources—Southern States of Brazil—Communications—Colonies in South Brazil—Hints to Farmers—Southern Chile—The Republic of Chile—Population and Immigration—Openings for Capital—Southern Provinces of Chile.

TEMPERATE BRAZIL.

The United States of Brazil.—The largest of the Latin American republics is Brazil, its area being 3,200,000 square miles, or nearly that of Europe, and its population in 1890 over 14,000,000. The census was, however, very imperfectly carried out, and the population is believed at the present time to exceed 16,000,000. Brazil was originally colonised from Portugal, and until 1889 was under the rule of an emperor of the Portuguese Royal house, hence the Portuguese and not the Spanish language is employed officially, and by the great bulk of the inhabitants. The constitution of the republic ultimately formed was framed in accordance with that of the United States, each of the twenty States having complete self-government, while a Federal Government and President at Rio de Janeiro are charged with foreign relations, with defence, tariffs for imports, &c. There is limited manhood suffrage, every male citizen over twenty-one, who is not illiterate, a beggar, a soldier, or a monk having a vote. There is no State religion, and, although an overwhelming majority of the people are Roman Catholics, there is complete toleration.

People and Resources.—Brazil is mainly a tropical country, and a large proportion of the natives are of "Indian" or negro descent, or belong to mixed races. These, with Italians and Chinese immigrants, are the only people fit for field labour in the tropical plantations which produce the staple crops, coffee and sugar, or for collecting the products of the tropical forests, such as india-rubber and dyewoods. People of North European race find occupation as overseers and merchants in all parts of

the country, and as miners in the eastern plateau of Brazil, the height of which neutralises its tropical situation. But the work of North Europeans is only to be fully exercised in the higher parts of the three southern states—Parana, Santa Catherina, and Rio Grande do Sul.

The Brazilian naturalisation laws require two years' residence, and naturalisation is not compulsory. The people of the numerous German and Italian agricultural colonies in the south retain their own languages; and for business purposes English is understood in every port. The greater part of the imports comes from the United Kingdom, and most of the carrying trade is in British ships. The exports go mainly to Germany, France, and southern Europe.

Immigration is encouraged by the Federal government, and in 1896 there were 156,000 immigrants, whose nationalities were as follows* :—Italian, 96,300 ; Portuguese, 24,100 ; Austro-Hungarian, 11,400 ; German, 1100 ; other nationalities, 23,100. The majority of the first three nationalities belong to the poorest and most ignorant labouring classes.

The import duties in Brazil are enormously high, amounting to 80, 100, and 120 per cent. of the value of such goods as spirits, tobacco, matches, medicines, cottons, &c. ; but agricultural implements, machinery, and tools are comparatively lightly taxed.

The tropical coast towns are unhealthy, and especially subject to yellow fever, the occurrence of which frequently leads to the imposition of quarantine on vessels arriving at other South American ports, after touching at Rio de Janeiro.

Southern States of Brazil.—The areas of the three southern states and their population in 1890 were :—

State.	Area Square Miles.	Population, 1890.	Density of Population.
Parana,	85,400	249,500	3
Santa Catherina, . . .	27,400	283,500	10
Rio Grande do Sul, . .	91,300	897,500	10

The northern part of Parana is crossed by the tropic of Capricorn, but the other two states lie entirely in the south temperate zone. The climate on the Atlantic seaboard of all

* *Statesman's Year Book*, 1899, art. "Brazil." In 1898, however, the immigrants numbered only 53,800.

three is very hot, but on the plateau and mountainous country of the interior it is agreeable, closely resembling that of southern Europe. Snow is practically unknown, but in winter it is not exactly a rarity to see a coating of hoar frost on the fields or a very thin crust of ice on the water in the early morning. The rainfall is ample for agricultural purposes, varying from over 60 inches a year in the north of Parana to about 40 inches in the south of Rio Grande do Sul. Rain falls in every month of the year, but summer (November to February) is the wettest season and winter (May to August) the driest. The prevailing wind in summer is from the north, and in winter from the south.

The land in the north slopes steeply to the Atlantic from the Serra Geral mountain range, and there is a long slope westward from the base of the mountains to the Parana and Uruguay rivers. In Rio Grande do Sul the watershed lies nearly in the centre of the province, giving equal slopes to east and west. The whole district is intersected by numerous rivers. Much of the land is occupied by forest, and the soil under the trees is rich and deep; but a large part, especially in the south, is open prairie or *Campo*, covered with natural grass, and soil that does not repay cultivation. Geologically, the ancient sedimentary and Archæan rocks predominate, and these contain great supplies of mineral wealth, including gold, silver, copper, and iron ores. As yet these are only beginning to be utilised. Coal occurs in the Carboniferous strata of all three provinces, and is being worked more and more every year, especially at Tubarao, in Rio Grande do Sul, by an English company. There are also quarries of fine granite and marble, deposits of kaolin, salt, and other minerals.

Communications.—Communication with the southern states has hitherto been only possible by sea, as there was no trunk line of railway in Brazil, but only separate systems radiating from different seaports. Now, however, a railway, begun at three points simultaneously, is nearly completed between São Paulo and Rio Grande do Sul. When it is opened there will be unbroken railway transport from Rio de Janeiro to the extreme south of the country. Paranagua, in the State of Parana, is a small town, with an open roadstead, but is the ocean terminus of a railway which runs west for about 450 miles to the Parana river, and sends branches north and south through the province and into Santa Catharina. A great lagoon, the Lagoa dos Patos, lies along the coast of Rio Grande do Sul for 160 miles, separated from the ocean by a broad strip of flat land. At its southern end it communicates with

the sea over a bar which prevents the entrance of vessels drawing more than $11\frac{1}{2}$ feet. At the mouth of the lagoon, but inside the bar, is the seaport of Rio Grande do Sul, from which a railway runs for 150 miles into the interior. At the head of the lagoon, Porto Alegre is rising into importance on account of its harbour and its railway, which runs inland for 250 miles up the valley of the Jacuni, and across to that of the Ibicui, which flows to the Uruguay. The completion of the new through line will link together all the railways of southern Brazil in one system.

Colonies in South Brazil.—The southern states are being exploited mainly by Germans and Italians, British influence being represented chiefly by the capital invested in mines and railways. The composition of the European population now growing up in these regions may be judged from the following analysis of the nationalities of the immigrants who entered Rio Grande do Sul in 1896 —

Italians,	917	Spaniards,	326
Russians,	606	Austrians,	274
Germans,	441	Hungarians,	103
Portuguese,	335	Poles,	41

Immigrants of seven other nationalities were returned at 52, and, out of a total of 3095, only one was British.

These immigrants are under the charge of a department of the Federal government, and are grouped in "colonies" practising cattle-rearing or agriculture, according to the nature of the district. There is still abundant room for newcomers, and there seems to be no reason why English-speaking "colonies" might not be established by those who prefer a warm and well-watered country to the extreme climate of Canada, or the aridity of South Africa or Australia. But it cannot be too strongly impressed on all people of North European races that no part of Brazil, except the three southern provinces, is fit for settlement. Efforts have very frequently been made, too often with success, by unscrupulous agents, to induce immigrants, to come to Rio de Janeiro, or other tropical port, and hire themselves out as labourers in the coffee plantations, work totally unsuited for any European or North American. Immigrants for the southern states usually land at Rio de Janeiro and tranship into Brazilian coasting steamers; but during their stay they should remain under the charge of the Federal officials, whose duty it is to see them safely to their destination.

Hints to Farmers.—From the valuable practical hints of a German settler in Curityba, Parana, to his compatriots at

home,* we quote the following observations as to the life and work in temperate Brazil:—

“In establishing a farm on the plateau, the land must be cleared of wood, for only the woodland is fertile enough for raising crops; the open *campo* serves merely as grazing for cattle. Maize is the most productive crop, and is a staple



Fig. 5.—South America.

article of food for man and beast. Wheat and barley are also most valuable crops, and potatoes yield a great return twice in the year. The typical Brazilian manioc root, and the vine, are both cultivated in the southern provinces.”

* *Führer für den Auswanderer nach Brasilien.* Von A. Papstein. Berlin, Deutscher Kolonialverlag, G. Meinicke. [1898.]

The great advantage of the system of "colonies" in developing the land is that the united strength and resources of a party of friends speaking the same language and living in the same way are able to clear the land, and stock it much more economically than if the individuals were scattered over a wide stretch of country in single families, as is done in North America. Road making in a new colony is carried out under the supervision of a Brazilian official appointed by the Federal government, and the colonists are required to give a certain amount of time to road making until their own needs in that respect are supplied.

The Emigrants' Information Office in London *strongly dissuades* British subjects from going to any part of Brazil.

SOUTHERN CHILE.

The Republic of Chile.—The republic of Chile runs through nearly the same range of latitude as Argentina, but occupies only a narrow strip of land, forming a long valley between the Cordillera of the Andes on the east, and a low range of hills bordering the west coast of South America. It may be divided into three regions:—(1) The arid deserts in the north, which are only rendered habitable at a few points by the mineral wealth making it worth while to import every necessary of life; these pass through a zone of dry land cultivatable by irrigation to (2) the fertile land of the Central Valley, one of the richest agricultural regions in the world; and (3) the well-watered, cool southern provinces and islands. Mineral wealth, especially copper ore, is widespread, and, when the price of copper is high, mining is actively pursued. In the south there is a good deal of coal, and silver, gold, lead, and manganese occur in considerable abundance.

The area of Chile is about 293,000 square miles, but only about one-half of the land has any inhabitants, and since the population in 1895 was almost 3,000,000, the average density is about 10 per square mile, or, taking account of the inhabited area only, 20 per square mile. The capital, Santiago, is situated in the central valley, and is the largest town; but the chief seaport, Valparaiso, concentrates the import trade of the country. The chief port for exports is Iquique in the north, on account of the nitrate and other mineral products shipped there. Concepcion, in the south, is an important and growing trading town.

Chile is a republic of a centralised type, the provinces not having separate legislatures. There have been fewer revolutions

than in other parts of Latin America, and, although the administration has been very defective, especially in the remote provinces, it has usually been on account of want of strength rather than want of honesty at headquarters. There are high import duties on manufactures, and also export duties, especially on nitrates. The currency is largely paper, the redemption of which was fixed in 1898 at the rate of 1s. 6d. per *peso*, the nominal value of which is 4s.

Population and Immigration.—The population differs considerably from that of the other republics. The educated classes are proud of their pure Spanish descent, but the working population is very largely mixed with the native Araucanian Indian blood. In the north of southern Chile, between the rivers Biobio and Valdivia, there is still a considerable number of pure and half-breed Araucanians, probably about 50,000, and these have formerly been a menace to settlers in their country, although they are now fairly under control. The foreign European element is small, and no nationality predominates very largely over the others.

Recognising the importance of developing the resources of the country, and of setting an example to the natives who share, but not in the highest degree, the indolence of South European races in America, the Chilean government has made strenuous efforts during the last twenty years to secure the immigration of North Europeans. At the census of 1885 there were in the country the following:—

Germans,	6800	Swiss,	1270
British,	5300	Chinese,	1160
French,	4200	North Americans, .	920
Italian,	4100	Austro-Hungarians, .	670
Spanish,	2500	Scandinavians, . .	430

The annual immigration amounted to 1400 in 1895, over 2000 in 1896, and under 1000 in 1897. The European immigrants of 1896 were composed as follows:—

French,	402	British,	361
German,	400	Dutch,	179
Spanish,	365	Belgian,	106
Italian,	274		

The object of the Chilean government is to introduce a great variety of foreign elements, so as to secure an ultimate blending with the Chilean race, and the general acceptance of the Spanish language; but no attempt is made to discourage the use of their own language, or the retention of their existing nationality by

immigrants. This experiment succeeds fairly well in the towns, but it is doubtful whether it can be fully successful in the case of agricultural settlements in the unoccupied country. To northern Europeans of the agricultural class, the difficulty of settling down in entirely new conditions under the supervision of Spanish-speaking officials is greatly aggravated when they are strangers to each other, speaking different languages, following different religious creeds, and, likely enough, nourishing hereditary antagonisms. No doubt the common hardships of beginning a new life in a new land do much to obliterate the old prejudices, but those "colonies" seem to have been the most prosperous which were composed originally of people from one country, with their own pastors and teachers to preserve the continuity of their former life. There is religious toleration, but churches with spires and bells are only allowed for Roman Catholic worship, and the power of the priests is great.

Openings for Capital.—Agricultural settlers are being placed on lands in the south only, where the climate is quite similar to that of north-western Europe, and where the native Chilean population is small or entirely absent. But throughout the whole range of the country there is scope for the development, by foreign capital and foreign energy, of the vast mineral resources. Much has already been done in this way, but the difficulties are of a special kind. Many of the richest mines are situated at such great elevations on the mountains that a new-comer is unable to work on account of the rarity of the air, and the supply of labour furnished by the native Indians is inadequate and ineffective. In those conditions it would appear that successful development of the resources can only be obtained by the expenditure of capital, particularly in the supply (and probably also in the invention) of machinery which will reduce human labour to an absolute minimum. Many railways have been built which are marvels of engineering skill, and a credit to the foreign capitalists, mainly British, who carried them out. As yet there is no railway running north from Santiago connecting the lines which run from the seaports to the mountains.

There is no country in South America so well adapted by nature as Chile to become a great self-supporting industrial state. The agricultural produce from the middle belt of the central valley alone, where wheat, maize, and the vine flourish greatly, could produce food for a great mining and manufacturing population, and the mineral resources supply every raw product which is required. The staple mineral export (after nitrate of soda) has always been copper, formerly as ore or regulus, but

recently as bars of pure metal. It is particularly important that the situation of any mines in Chile should be definitely ascertained before undertaking any responsibility regarding them, as the quality of the ore gives no clue as to the cost of working it, which depends more upon facility of transport and the supply of food and fuel. Thus, mining operations in the desert region of northern Chile involve the import of every article required for consumption, in many cases even of water, and the intense heat of the climate has also to be taken into account. In the south of Chile, on the other hand, food, water, and fuel are abundant, indeed, the difficulties to contend with are the excessive rainfall, floods, and the exuberance of the forest growth.

So far as foreign influence on the development of Chile goes, it may be said at present to be exercised mainly by British capital and German settlers.

Southern Provinces of Chile.—The southern railway system of Chile, when complete, will run from Santiago, the capital, with branches to the chief seaports, to Puerto Montt, a distance of 600 miles. As yet, however, there are gaps in the system which are being gradually reduced, and will probably be filled up by 1901. Puerto Montt is situated at the southern end of the central valley, the western side of which is continued southward by the island of Chiloe and the Chonos archipelago, while the coast of the mainland is formed by the slope of the Andes. As far as Puerto Montt there are scattered German agricultural colonies, with small towns containing breweries and distilleries, and on the coast there are several ports, of which Valdivia (one-third of whose inhabitants are German) is the most important. All ordinary European grain crops can be grown, although the climate in the south is too cloudy and damp to allow wheat, or even barley, to come to perfection. The mineral resources are being explored and utilised. The German agricultural settlers have taken firm root in the country.* Although encouraged and helped by the Chilean Government the advent of foreigners is unwelcome to the people of the country, and much unpleasantness, and even danger to life, has occurred on that account. But in the southernmost part of

* The best account of the colonisation of southern Chile, and the history of the various German settlements, is to be found in Hugo Kunz's *Chile und die Deutschen Colonien*. The first edition was published by J. Klinkhardt, Leipzig, in 1891. The English point of view is well given in W. Anderson Smith's *Temperate Chile*. London, A. & C. Black, 1899, which is based on a recent visit to the country.

Chile there are few Chileans, and new settlers need fear little inconvenience except from the natural difficulties of land and climate. The island of Chiloe, and the other wooded islands to the south, offer opportunities for developing a large timber trade, although competition with Oregon, Washington, and British Columbia is severe; and cattle rearing is likely to meet with success in the open or cleared ground of the whole region. As yet, however, there is little cleared ground, and the continuous covering of primeval forest in the southern islands, and over the mountain slopes, has hitherto prevented any settlements of importance from being made south of Chiloe. The cloud, which rarely lets the sun appear for half the year, and the rainfall of over 100 inches (most of which falls in winter, although a perfectly dry day is the exception in most months of the year) makes the ripening of grain impossible on the western islands and coast strip. Root crops, however, flourish, especially the potato, the original home of which is believed by many to be southern Chile. The want of roads, even in Chiloe, is a serious bar to progress, and transport is everywhere very difficult.

The land bordering the rivers that pierce the Cordillera, and the great valley of western Patagonia, is much drier, and will probably prove of agricultural value when the boundary line with Argentina is settled, and colonists begin to come into the country. Important trade will doubtless also be established across the Cordillera by railways through the valleys from Chilean ports.

Meanwhile, British consular officers in Chile do not encourage the immigration of their countrymen with a view to taking up farms. The difficulties, of course, are no greater than in the case of Germans, but there is a natural feeling that, in view of the fewer hardships to be encountered in the temperate British colonies or the United States, emigrants from the United Kingdom would do better not to think of South America as a home.

In referring to the efforts of Chilean Government Agents to induce colonists to come to Chile, the annual consular report for the Valparaiso district for 1897 gives the following warning:—

“The climate in the south of Chile is excessively damp, the rainfall being abnormally great, and a strong constitution is required to withstand its effects. A still greater disadvantage is the lack of proper police protection. The districts thrown open to the colonists are of very large extent, and in many of these it has been found impossible to maintain sufficient police to protect the inhabitants from outrages on the part of

organised bands of robbers. Indeed, in some instances, wanton murder has been committed. These latter remarks apply only to colonies on the mainland. In the island of Chiloe there is adequate police protection, but here, too, there are the same climatic disadvantages, and an excessive amount of labour is required for preparing the land for cultivation, the island being very thickly wooded. Many disappointed emigrants have applied for relief at this Consulate, and, on the whole, British subjects are not advised to emigrate to this country."

CHAPTER X.

A R G E N T I N A .

Position—Surface—Climate—Resources—Exports and Trade—Government—People—Tariff and Currency—Railway Enterprise—Provinces—The Argentine Railways—New Lands of Argentina—Province of Buenos Aires—Entre Rios—Corrientes—Santa Fé—Central Provinces—Western Provinces—Central Territories—Southern Territories—Patagonia.

Position.—The Argentine Republic occupies the narrowing southern end of South America, between the Atlantic Ocean and the crest of the Cordillera of the Andes. In the north it reaches to 22° (well within the tropics), and in the south to 56° , in the almost Antarctic island of Cape Horn. It occupies a longer stretch of the Earth's surface from north to south than any other country in the world (except Chile), which does not cross the Arctic circle. It has a total area of nearly 1,800,000 square miles.

The Argentine Republic is bounded by Chile along the crest of the Andes, Bolivia in the north, Paraguay in the north-east, and Brazil and Uruguay in the east; but south of the mouth of the Rio de la Plata (River Plate) it has a long sea coast on the Atlantic, indented by many bays.

Surface.—The west of the country is high and mountainous, forming the eastward slope of the Andes; the rest is nearly level plain, or gentle slopes broken by few hills. The central portion of this plain is termed the Pampa, and is covered for the most part by a fine soil, not unlike that of the North-American prairies; and, like the prairies, is rich in grass but poor in trees.

The basin of the River Plate includes the whole northern part of the country drained by the great rivers Uruguay and Parana, which flow southward almost parallel to each other to unite in its eastward running estuary. The Uruguay is the boundary with the small republic of the same name. The Parana, with its tributaries, the Paraguay and Pilcomayo, separate the territory of the republic of Paraguay. South of

the Pilcomayo, the long rivers Vermejo, Salado, and Segundo are the chief tributaries from the Andean slopes.

South of the River Plate the rivers Colorado, Negro, Chubut, and Santa Cruz are the chief streams flowing from the Andes to the Atlantic. The rivers of the Argentine do not form a complete drainage system. In the whole western strip of the country many of the streams from the mountains fail to reach the main rivers and dry up in salt lakes or swamps amidst arid steppes, which, in some places, may even be called deserts. It appears that this process of drying up is still in progress, so that in all parts of the country irrigation will become an increasing necessity. All the great rivers are navigable for many hundreds of miles. In the south, where the Andes are low, and passes to the Pacific numerous and easy, the boundary line with Chile is not yet quite settled. Here there are some fine fresh water lakes of remarkable beauty, the largest of which, Lake Buenos Aires, lies in the disputed territory. The most striking feature of the country to which the River Plate gives entrance is its amazing flatness, allowing of the construction of railways more cheaply than in any other part of the world.

A large part of the country remains practically unexplored, and, although preliminary geological and railway surveys have been made in most of the provinces, there is nothing as yet in the nature of an exact survey of the whole republic, and accurate large-scale maps cannot be constructed.

Climate.—The climate varies greatly from point to point on account of the vast range in latitude. A rough classification recognises four climatic areas:—(1) A *mountain climate* along the whole of the Andean slope; the temperature, depending on the altitude (which increases towards the north), insures agreeable sites for towns or settlements all along the western border, although the deep valleys are always very hot. Three different climatic areas divide the plain. (2) A *tropical climate* in the north, from 22° S. to about 33° S.—i.e., in the territories of Chaco, Formosa, and Misiones, and the provinces of Tucuman, Santiago del Estero, and Corrientes. Here the mean temperature is high, the range between the seasons comparatively slight, and the rainfall, which occurs mainly in the summer, is heavy, (3) A *temperate climate*, between 33° S. and 42°—i.e., as far as Bahia Blanca and the Rio Colorado. Here the mean temperature is lower, the range between summer and winter greater, but the rainfall less, the greatest amount occurring in summer. The climate in this belt is considerably warmer at all seasons than in any part of Great Britain while the contrast

of the seasons is little felt, and people can sleep unsheltered in the open air at all seasons without discomfort. (3) A *cool climate* prevails in Patagonia, where the summers are cool and the winters fairly cold, with snow and frost in the higher ground; but the climate, so far as meteorological observations have been made, seems to be less severe than that of Europe in the corresponding northern latitudes. The rainfall also is slight. It is only in Tierra del Fuego that extremely inclement winters are found.

Since the Argentine republic lies entirely in the southern hemisphere, the seasons are opposite in their periods to those of the northern hemisphere. Midsummer is towards the end of December, and midwinter towards the end of June. The contrast of climate at corresponding latitudes in North and South America is very marked. The narrowness of the temperate part of South America allows the influence of the sea to modify the climate, preventing the great extremes of heat in summer and of cold in winter, which make the northern continental climates so trying.

Resources.—The natural resources of Argentina have been developed mainly in the pastures and by agriculture. There are mineral deposits of some value, alluvial gold in southern Patagonia and in the mountains, silver and copper ores containing gold in the Andean region, and lignite and petroleum in several of the provinces. None of these, however, suffices even for the domestic supply. The tropical forests of the north—particularly in the region of the Gran Chaco—yield some valuable timber and other produce which is being utilised more and more. Agriculture is steadily progressing, and in 1895 there were 15,000,000 acres under cultivation, but this forms scarcely more than 6 per cent. of the area which is capable of being brought under the plough. Wheat is the chief crop, and usually leaves a large surplus for export. Vines are grown and wine made, while maize, flax, and sugar-cane are important products in different parts of the country. Locusts inflict serious loss on farmers at irregular intervals. Most of the occupied land is under sheep, and Argentina contains more sheep than any other country, except Australia. Cattle are also kept in large numbers, and the preparation of meat extract is an important industry. Ostrich breeding has been introduced from Africa, and both silkworm and bee culture are acquiring importance in the warmer parts of the country.

Exports and Trade.—The chief exports are wool (which is not of the first quality), hides, and meat (either frozen or in

the form of extract), the animal products amounting to about 73 per cent. of the total value of the exports in 1897. Wheat and other agricultural produce made up 23 per cent., and forest produce nearly 2 per cent. Hence it appears that the Argentine at present is a more purely pastoral and agricultural country than any other that could be named.

Manufactures are but little developed, and the imports consist mainly of manufactured articles. The United Kingdom stands first in shipping and in total trade with Argentina. This is most marked in the case of imports. In 1897 (an average year) imports of British manufactures amounted to more than three times the value of those sent out by either Germany, France, the United States, or Italy, all of which were about equal as regards their share of the import trade. But as a market for Argentine exports, the first place is taken by France (the trade with which is, however, declining), then follow Germany and the United Kingdom, and, a long way behind, the United States, Brazil, and Belgium. The predominance of British commerce is not the only bond between Argentina and the United Kingdom. The railways and banks owe much to British capital, and the numerous loans which have been raised from time to time by the provinces as well as by the republic have most frequently been negotiated in London.

Government.—The Argentine is a federal republic on the model of the United States, and for a Latin republic it has been exceptionally free from revolutions. There are fourteen Provinces enjoying complete self-government, including the election of governors, and nine Territories under the control of the Federal government. The President of the Republic, who is elected for six years, and cannot be re-elected, has, in consultation with his ministers, the sole executive power. The legislative power of the Federal government is exercised by a Congress elected by the people (which is fixed by statute to include one representative for every 33,000 of the population), and a Senate elected by the provincial governments. The administration of justice and the conduct of public affairs of every kind has improved greatly in recent years, and affords a better guarantee for fair treatment and adequate protection than most of the Latin republics can offer. But it must be remembered that Federal jurisdiction does not extend to provincial affairs, every province having its own laws.

Citizenship in the republic can be acquired at will after a residence of two years in the country, or even without residence, if the candidate has entered the public service or introduced

any industrial improvement. But any immigrant may, if he desire it, retain his original nationality, a right which is not accorded in some of the Latin republics. Everyone born in Argentina (except the children of Ministers representing foreign countries) becomes a citizen, whatever be the nationality of the parents, and at the appointed age has the same liability to military service as other Argentines.

The President of the Republic must by law be a Roman Catholic, but there is complete religious toleration in fact as well as in theory.

People.—The population in 1895 was found by census to be just over 4,000,000, of whom 1,000,000 were foreigners, the remainder being Argentines of Spanish descent, or the descendants of foreign immigrants, or naturalised citizens of foreign birth. There is a very small proportion of native Indians, and people of mixed race are also much less numerous than in the other republics. Although Spanish is the official language, there is probably no country where so many languages are spoken or so many newspapers published in foreign tongues. The Buenos Aires *Standard*, an English journal, is widely recognised as one of the best newspapers, not only in the Argentine, but in Latin America, and its columns abound in practical information regarding the country invaluable to any English-speaking person interested in Argentina. There is a British Consul at Buenos Aires, and British Vice-Consuls at Buenos Aires, Bahia Blanca, Concordia, Cordoba, La Plata, Parana, Rosario, and Santa Fé. Special privileges and exemptions are afforded to those who take up new land or introduce new industries to the republic. From the diversity of population a new people seems likely to arise, different from any European race, but combining in various degree the qualities of all. The proportions in which the racial elements are being mixed is illustrated in the following table of nationalities represented by over 100 persons each, amongst the immigrants of 1897, who numbered almost 73,000* :—

Italians, . . .	44,678	British, . . .	562
Spanish, . . .	18,316	Swiss, . . .	390
French, . . .	2,835	Belgians, . . .	207
Austro-Hungarians, .	1,768	Uruguayans, . . .	203
Turkish subjects, .	1,144	Portuguese, . . .	195
Germans, . . .	987	Danish, . . .	111
Russians, . . .	617	Rumanians, . . .	100

* These statistics, and many of the facts stated in this chapter, are derived from Charles Wiener's *La République Argentine*, forming a report to the French Ministry of Foreign Affairs, and published as a volume of 678 pages by Cerf, Paris, in 1899.

Next on the list came 94 North Americans and 355 representatives of ten other nationalities. These proportions fairly represent the average immigration of the last forty years. Recently large settlements of Jews, chiefly from Russia, have been made in various provinces by the Jewish Colonisation Society.

Trade and Currency.—There are import duties on all manufactured articles, the rates being sometimes as high as 40 per cent. of the value of the goods, and there are also export duties, though on a much lower scale and applying less generally. In 1897 about 85 per cent. of the imports (by value) and 62 per cent. of the exports were subject to duty. This necessarily embarrasses foreign trade, while encouraging to some extent the creation of manufactories in the country, an object which has as yet only been partially attained.

The currency of the Argentine is in a very unsatisfactory state. While the nominal value of the gold peso or dollar is 4s., gold or even silver coin is rarely seen. Up to 1895 the currency was practically all paper, notes being issued for all values down to 5 centavos, which at par would be equal to 2½d. But the currency is so depreciated that the peso is worth as little as 1s. 6d. at times, the fluctuations of its value making it quite impossible to translate Argentine prices into sterling value without knowing the rate of exchange at the moment. Since 1895 nickel-bronze coins for small values have been struck, but the supply of these is inadequate to the demand.

Railway Enterprise.—A great amount of capital, mainly British, and estimated at as much as £500,000,000, is invested in the railway system of the Republic, which, favoured by the configuration of the country, has been greatly developed. The lines are on different gauges; that of the main lines is 5 feet 6 inches, with a great deal of metre-gauge line in the outlying districts, some of a still smaller gauge in the mountains, and a little on the standard European and North-American gauge of 4 feet 8½ inches. Although in 1897 there were 9270 miles of railway open for traffic, the lines did not make a single junction with those of the neighbouring republics. Those of the east indeed connect by ferries on the Uruguay river with the railways of that State, but that is comparatively unimportant as those lines do not connect with Buenos Aires, and, besides, Uruguay has free access to the Atlantic. When the railways are pushed across the Andes to Chile, and up the great Andean plateau to Bolivia, the through traffic will be beneficial to Argentina and will inaugurate a new era of prosperity to Bolivia at least.

Provinces.—The provinces of Argentina have each a capital, usually bearing the same name, and forming the political, commercial, and social centre of that part of the country. In this way the republic contains a number of important and prosperous towns scattered over its area. The chief province is that of Buenos Aires, on the south of the La Plata estuary. Together with the city of Buenos Aires, which is politically separated from it, the population amounts to three-eighths of that of the whole country, while the area is only one twenty-seventh. It is well served by railways radiating from Buenos Aires, now the chief sea-port of South America in spite of the shallowness of the estuary, which made it necessary to construct a purely artificial harbour. La Plata, the capital of the province of Buenos Aires, and Rosario, on the Parana, are practically the only other sea-ports of the country for foreign trade. With a population of over 600,000, Buenos Aires is one of the most active cities in the world, and quite the most cosmopolitan. It is the market and gateway of the country, even more fully than New York is that of the United States.

The other littoral provinces are Entre Rios and Corrientes, on the fertile ground between the Rivers Uruguay and Parana, and Santa Fé, on the right bank of the Parana. In the extreme north there are three territories—Misiones, between Paraguay and Brazil, Formosa and Chaco in the tropical forest region. The railways serving the provinces of Entre Rios and Corrientes are not part of the main system, but connect river-ports on the great water-highways. Santa Fé, on the other hand, is very closely covered with lines radiating from Rosario on the Parana, one of the chief stations on the northern and north-western railways, which run from Buenos Aires.

The Central provinces are Cordoba, west of Santa Fé, with San Luis to the west, and Santiago del Estero on the north. These being away from river communications are entirely dependent on the railways.

The Cordilleran and Northern provinces lie on the mountainous land of the eastern slope of the Andes, and are named, from south to north, Mendoza, San Juan, Rioja, Catamarca, Tucuman, Salta, and Jujuy. These are being gradually penetrated by branches of the great railways of the plains, the work of construction in the rugged mountainous country not admitting of rapid extension.

In the south, the territory of the Pampa lies just west of Buenos Aires, and Patagonia is divided into the four territories of Neuquen, Rio Negro, Chubut, and Santa Cruz, each stretching

from Andes to Atlantic, and each named after its central river. The only railway as yet penetrating them is the extension of the Southern Railway across the Colorado River to the upper waters of the Río Negro, on the way to Lake Nahuel-huapi. The last territory is the eastern portion of Tierra del Fuego.

Argentine Railways.—The chief railway lines radiating from Buenos Aires considered simply as lines of communication, without regard to their ownership, are—(1) the western line through San Luis (500 miles from Buenos Aires*) and Mendoza (650) to Punto de las Vacas (740). This line is planned to cross the Andes through a tunnel south of Aconcagua; but owing to the failure of the contractors to complete the work it has remained for many years unfinished, and its railhead is separated by 40 miles of mountains from the terminus of the Chilean railway from Valparaiso.

(2) The northern line from Buenos Aires to Rosario (190 miles) in Santa Fé, and thence across Santiago del Estero to Tucuman (730). Tucuman is also reached by a narrower gauge line from Rosario *via* Santa Fé, and by another *via* Cordoba (250 miles from Buenos Aires), which sends branches into the province of Rioja and to Catamarca (570 miles from Buenos Aires). These lines are continued by a railway of the same gauge to Jujuy (950 miles from Buenos Aires), with a branch to Salta. This is the line which may be continued to the Bolivian frontier.

(3) The southern lines radiate over the province of Buenos Aires from the federal capital to Bahia Blanca (420 miles) and to several other points on the coast of the province.

The existing railway system has been criticised on account of the diversity of the gauge, and because the lines are not planned so as to tap the districts of richest resources, but leave some important regions entirely untouched, while duplicating the connections in other places. It is only fair, however, to point out that the railways are being worked rather with a view to the ultimate development of the country than with the object of making large immediate profits.

NEW LANDS OF ARGENTINA.

Except in the capital, there is no part of the Argentine Republic where room cannot be found for energetic and resolute men willing to spend time and at least some capital in develop-

* Distances measured on Col. Church's railway map of the Argentine Republic in *Geographical Journal*, vol. xii. (1898), p. 444.

ing the natural resources. Everywhere it must be remembered that the difficulties will be found greater than in the undeveloped lands under the government of the English-speaking peoples. The absolute minimum considered necessary for life is much lower in Argentina—stories are told of settlers living for years without tables or chairs, yet unconscious of any special hardships—and, if wages for unskilled labour are low, the capacity of the workers is lower still. The Gaucho, or half-wild herdsman of the pampa, is a difficult servant for an alien to manage, and the Indian of Patagonia is no easier to deal with. Above all, though the government is far from bad when judged from the Latin-American standpoint, it is seriously defective if judged from that of Canada or the United States. There are, however, many places where for generations to come small colonies of any nationality can settle down and live their own life untroubled by taxes and free to govern themselves, for no country in the world is so generous to aliens as the Argentine, the only return asked for the grant of land being the development of its resources. The second generation will be Argentine citizens by right of birth, but their feelings as to language and occupation will be respected.

Province of Buenos Aires.—This province has the most favourable position, the largest share of the coast—along the estuary of the La Plata and on the Atlantic southwards to Bahia Blanca—and a surface which, while low and sometimes swampy in the north, rises in the south into ranges of considerable hills. The railway system from Buenos Aires as a centre forms a means of readily reaching any part of the province. The capital, La Plata, contains, with its harbour of Ensenada, a population of 70,000, and carries on a large trade in the export of maize, meat, wool, and sheep. Three-quarters of the shipping trade of the port is under the British flag. The next town in size is Bahia Blanca with 10,000 inhabitants, a seaport exporting wheat, salt, and the products of sheep-raising.

Agriculture is in an advanced state in this province. The north is most thoroughly farmed, though most of the land is under grass and lucerne for stock; the east is barren with salt lagoons, and offers no inducement to cultivation; but the south is very fertile, and farms are prosperous. The chief crops are maize (to which more than half the cultivated land is devoted), wheat, and flax, the latter grown almost exclusively for linseed, which is exported. Oats and barley are grown to a much smaller extent, the latter being chiefly used green as fodder. The amount of live-stock is very large, and forms the chief

wealth of the country. In 1895 there were 52,600,000 sheep, 7,740,000 cattle, and 1,670,000 horses. Goats and swine are relatively unimportant; but the industry of ostrich-rearing is sufficiently characteristic to be mentioned. There were in 1895 nearly 60,000 of these birds kept for their feathers.

The industries of the province depending on its produce are confined to distilleries, breweries, flour-mills, great saladeros or slaughter-houses, and meat-preserving works. The only mineral resources are some stone quarries in the hilly region near Tondil in the south.

The northern part of the province, where stock-raising is centred, is pretty fully occupied, and the south is rapidly being taken up; but there is plenty of vacant agricultural land in the western districts, and labour is plentiful and cheap.

The large flax crop suggests the possibility of utilising the fibre and establishing a linen industry.

The marshy islands of the Parana delta seem to be well adapted for rice culture on a large scale, and experiments in this direction might well be made. Willows, poplars, and other trees have been introduced and are flourishing on the islands, and some brick-works have been established for utilising the alluvial clays. In brick and tile-making industries there should be potential fortunes.

Although conveniently situated for communication with the outer world, this province does not offer to the English-speaking settler the same attraction as others further afield; the neighbourhood of the huge city of Buenos Aires being a disturbing element, with an ever-present risk of commercial or political crises, which affect the whole province more or less.

Entre Rios.—This province occupies the south of the "Argentine Mesopotamia," lying, as its name implies, between the rivers Parana and Uruguay, and the alluvial soil of the low land bordering the rivers is the most fertile and the deepest in the republic, so that there is no fear of its being exhausted. Communication and transport is effected by excellent steamers running on both rivers with their termini in Buenos Aires, and also by railways. Great efforts have been made by the government to develop the agricultural resources of the province, especially in the way of encouraging the settlement of "colonies" or groups of families. These have the privilege of freedom from taxation for ten years, and the proprietors of uncultivated land near the railways can be compelled by law to sell to settlers who are prepared to farm it. The price of land varies greatly, according to its position with

respect to railways and rivers. The climate is warm, and frost is quite unknown.

The towns of the province are all small. Parana, the largest (22,000), and the capital of the province, stands on the bank of the Parana River opposite Santa Fé, and has a railway to Concepcion, on the Uruguay, with branches to the other towns of the southern part of the province. Concordia, higher up the Uruguay, and the terminus of the railways from Corrientes, has the largest shipping trade for the export of farm produce on the river. Out of 10,000 agricultural settlers in 1895, 5200 were Argentines, 1600 Italians, 680 Russians, and the next nationalities in numerical order were Spanish, French, Swiss, Uruguayan, German, Austro-Hungarian, and British, the last named numbering only 154.

The greatest area of the cultivated land is under wheat; lucerne, maize, and linseed come next, while pea-nuts also form an important crop. The harvests, 1895-96 and 1896-97, failed so seriously that the merchants of Buenos Aires and the Federal Government had to subscribe for the purchase of seed for the year following; but agriculture is usually very prosperous. The rearing of cattle and sheep is relatively less important, but the province contained in 1895 about 2,800,000 cattle and 62,000,000 sheep. The trees growing by the rivers yield some trade in timber. There are no mineral resources of any kind.

Corrientes.—The province of Corrientes, lying between the rivers north of Entre Rios, is too warm, and, in great part, too swampy for settlement by North Europeans. There are relatively few sheep, but many cattle, and, although most of the cultivated land is under cereals, a great deal is under tobacco, sugar-cane, cotton, rice, and other sub-tropical crops. In the north, the province, like the territory of Misiones north of it, is thickly wooded, and almost uninhabited.

Santa Fé.—The province of Santa Fé, on the right bank of the Parana, which is as large as England, is entirely flat, the ground being covered with a considerable depth of remarkably fertile soil, which has been compared to the famous "Black Earth" of southern Russia. The climate is hot, like that of Spain and Italy, and, the rainfall being steady, the province has become the chief agricultural area in the republic. Not much more than one-tenth of this area is under cultivation. Three-quarters of the cultivated land is under wheat, the province yielding half the wheat crop of the republic. Linseed and maize are the only other crops produced in large amount. In 1895 there were more than 2,000,000 cattle, and rather less than 2,000,000

sheep. There are no mineral resources except clay for brick-making, an industry which might be considerably developed. Flour-milling is carried on on a fairly large scale, but this also could be extended. It was in Santa Fé that the principle of developing the land by means of agricultural colonies was started, and in 1895 there were no less than 365 such colonies in existence, occupying the greater part of the south of the province, including several settlements of Russian Jews sent out by the Jewish Colonisation Society.

The south of this province is better served by railways than any other part of the country, and Rosario, on the Parana, is the second town in point of trade and population (over 100,000). It has direct ocean trade with Europe as well as a large river trade with the interior. Santa Fé city, the capital of the province, is a great railway centre, and collects large quantities of agricultural produce.

The tropical territories of Chaco and Formosa are wild forest country.

The Central Provinces.—The provinces of Cordoba, Santiago del Estero, and San Luis occupy the level plains of the centre, and rise on the westward slope of the country. Cordoba is the largest province of the three, and the most favourable for agricultural settlement, as its produce is that of the temperate region, mainly wheat, lucerne, maize, and linseed. In the north, and in Santiago del Estero, sugar-cane is the most important crop. Towards the west irrigation is necessary, and great efforts have been made in Cordoba to store water in dammed-up valleys for use in the fields. These provinces contain some mineral wealth which is not at present being worked. Mines of gold, silver, and copper have been opened in Cordoba and in San Luis, but abandoned. With intelligent and energetic management, something may possibly be done in developing mineral resources, but the want of coal will always be a serious drawback. Railway communication is already good, and can be greatly extended.

The Western Provinces.—All the western provinces are thinly peopled, and their development is only beginning. The three northern provinces of this group—Jujuy, Salta, and Tucuman—are purely tropical. Sugar production is the staple of Tucuman, the damp climate of which is unhealthy for Europeans, and sugar is also extensively grown in the other provinces, while Salta has very important vineyards. The mineral resources of the mountainous portion of Jujuy have frequently attracted attention, and spasmodic efforts have been made to

work gold, silver, copper, and other products ; but, so far, these have not proved remunerative. The capitals of the three provinces are accessible by railway.

The provinces of Catamarca, La Rioja, San Juan, and Mendoza are all too dry for successful agriculture without irrigation, but irrigation is comparatively easy on account of the slope of the ground, and the existence of numerous streams fed by the snows of the Andes. Prosperity is retarded by the great cost of railway transport to the east, and by the failure to complete the Trans-Andean railway, which would give easy access to the markets of Chile, with which at present intercourse is only possible over high and difficult passes. Earthquakes have frequently done great damage to towns ; in 1861 Mendoza was destroyed by a severe shock, and 10,000 people perished. The vine is the staple product, and wine making is carried on in all the provinces, especially Mendoza. Vine growing is a branch of agriculture which can only be made profitable by experts.

The mineral wealth of the region is undoubtedly very great ; but hitherto the results have been extremely poor. This is said * to be due to the rough methods employed, the cost of railway transport, the want of cheap fuel, and the absence of skilled direction. While all the Andean provinces contain gold, silver, lead, copper, and iron in large quantities, they have been worked most in San Juan ; but almost all the efforts made have resulted in failure. A blast furnace for reducing iron, for example, was established at Desengaño in 1893, but was destroyed by an earthquake in 1894 and not rebuilt. Capital and perseverance are necessary in order to achieve success.

The Central Territories.—The territory of the Central Pampa, stretching from the province of Buenos Aires to Mendoza, and bounded on the south by the Rio Negro, is a vast stretch of level or undulating open land, covered with coarse grass. The growth of trees, especially the carob tree or *algarrobo*, improves the land for pasture, and some planting is being carried on. The pampa is essentially pastoral country, and this territory contains over 5,000,000 sheep, tended by the *gauchos* or native herdsmen. The export of wool is facilitated by railways to Buenos Aires city and to Bahia Blanca.

The western territory of Neuquen occupies part of the eastern slope of the Andes and of the depression at its foot, extending southward to the picturesque mountain-girdled lake Nahuel-huapi, and the River Limay, which carries its waters and those of a row of smaller mountain lakes to the Rio Negro.

* Wiener, *La Republique Argentine*, p. 488.

The country has a fine climate and a good soil, being well adapted for farming by a northern people. Dr. Francisco Moreno, who has explored the whole of southern Argentina, says of it :*— “The valley of Chimehuin is already the seat of a prosperous township. Junin de los Andes (2560 feet) which will become the emporium of the riches of those regions so soon as a sufficient population arrives to exploit them, and the trans-continental railway is constructed on the route indicated by Captain Fitz Roy in 1834 as being the easiest means of communication between the Atlantic and the Pacific, which is that of Puerto San Antonio, on the Bay of St. Matias. The region in the neighbourhood of Junin de los Andes, watered by the rivers Chimehuin and Malleco, is one of those which has the best future in the Neuquen territory, in Northern Patagonia. It possesses extensive pasture lands, the *Araucaria* forests beautify its landscapes with their fantastic foliage, and strawberries abound in the proper season, amongst the apples introduced in very early times.”

The railway referred to above is to be built immediately, the Argentine Government having changed an order for one million pounds worth of war material to the same value in steel rails and rolling stock, when it decided to arbitrate on the question of the boundary with Chile instead of to fight over it. There was never a more perfect application of the principle of “beating swords into ploughshares.” Meanwhile communication is maintained by railway from Bahia Blanca to Confluencia at the junction of the Neuquen and Limay with the Rio Negro, and thence by road more than 100 miles to Junin. The extreme beauty of Lake Nahuel-huapi will open a tourist centre, and afford an opportunity for enterprising hotel proprietors when the railway comes nearer.

The Southern Territories.—Patagonia is divided into the territories of Rio Negro, Chubut, and Santa Cruz, running from east to west. The eastern portion is a gently sloping arid plain with salt lakes, the salt in many places being of commercial value ; but this sterile region is divided transversely by deep valleys through which rivers flow from the Andes to the Atlantic. The bottom of these valleys is fertile with good soil, and a considerable amount of land can be reclaimed by irrigation. The west of the territories includes the richly wooded Andean slopes, and the large fresh-water lakes of the region through which the disputed boundary runs. This, although the winters are snowy and cold, is reported to include much fertile

* *Geographical Journal*, vol. xiv. (1899), p. 366.

farming land which may one day prove of great value. At present it is practically without inhabitants and is difficult to reach. The Rio Negro is navigable for several hundred miles, and there are many settlements on its banks, including large and prosperous farms which were allotted as rewards to officers in the Argentine army and navy. Oyster culture might be attempted with some chance of success in San Matias Gulf, and fisheries could easily be established at the same place. Salt is abundant for curing purposes, and the Argentine population would form a great market. The Chubut Valley is less thickly settled, but it contains an extremely interesting Welsh colony which was established in 1865, and succeeded after years of the most distressing struggles in initiating a system of irrigation which has made the district prosperous. The colonists, who are Argentine citizens, retain the Welsh language even in the second generation. A short railway runs for 43 miles from Trelew, one of the centres of the Welsh colony to Porto Madryn, a port on Golfo Nueva. A train runs only when a ship calls at the port, which is about once in three weeks.

The west of these territories will probably be found to be rich in gold and other minerals, and gold has been found in paying quantities in Tierra del Fuego in the extreme south. As yet, however, the country is practically unexplored and has never been prospected. It offers a fine field for the enterprise of hardy and adventurous men with some experience of life in the open and tact enough to get on with the mixed nationalities and the few native Patagonian tribes.

In addition to the works cited, trustworthy information will be found in the *Argentine Republic* handbook published by the British Emigrants' Information Office, and the descriptions of recent travellers in the Patagonian territories in C. E. Akers' *Argentine, Patagonian, and Chilian Sketches* (London, Harrison & Son, 1893) and in J. R. Spears' *The Gold Diggings of Cape Horn* (New York and London, Putnam, 1895), a book which describes travels throughout Patagonia. The country on the Argentine border is very fully described by Dr. Moreno in the *Geographical Journal*, vol. xiv. (1899), pp. 241 to 269 and 353 to 373.

CHAPTER XI.

THE FALKLAND ISLANDS.

Surface—Climate—Resources—Prospects.

Surface.—The Falkland group consists of two large and many small islands lying close together off the south-east of South America, between latitudes 51° and 53° S. and 480 miles north-east of Cape Horn. The land is rough and rugged moorland, composed in large part of peat bogs, which furnish fuel, and rises in some parts into hills, only one of which reaches 2300 feet in height. The soil is not infertile, and vegetable gardens are successfully cultivated; but the high winds which prevail, and the entire absence of trees for shelter, make it impossible to grow grain. The grass furnishes good pasture; formerly it was used mainly for cattle; but now sheep are kept in large numbers, and cattle-rearing has declined in importance. The area of the colony is 6500 square miles, and the population in 1891 was only 1789.

Climate.—The climate is healthy, though not agreeable to strangers. The mean temperature of the year is under 45° F., and extreme heat is quite unknown, while in winter the temperature rarely falls below the freezing point. The rainfall is light, only about 30 inches in the year, but mist and light rain occur very frequently.

Resources.—The one town is Stanley in East Falkland, which has a harbour and means of refitting ships that may have been damaged in the heavy seas while rounding Cape Horn. The islands are not capable of great development, as the old industry of seal-hunting has come to an end, and the Crown lands available for sheep-farming have all been disposed of. Copper and iron ores exist, but they have never been utilised, and the quantity available is unknown.

The Falklands form a British Crown Colony, although almost the only steamers entering Port Stanley are under the German flag, as the Kosmos line, of Hamburg, trading to South America, holds the mail contract, and makes monthly calls. The trade however, is almost exclusively with the United Kingdom, the

only exports of importance being wool, tallow, and hides. Frozen mutton was formerly exported.

The ship-repairing yard at Stanley is the property of the Falkland Island Company, which concentrates the commercial and industrial activity of the whole colony, establishing a practical monopoly with which no local competition is possible. The capital of this company is small, and its dividends are large and steady.

Prospects.—The Annual Report to the Colonial Office of the Falkland Islands for 1897* sums up the present condition of the colony thus:—"Allowing for comparative poverty of the natural grass, the islands form quite an ideal sheep farm. There are no troublesome forests to clear away, no deep and dangerous rivers to be crossed, no dingoes to harass and destroy the stock, no prolonged droughts, and, above all, no rabbits to annoy the farmer and involve his yearly output in a disagreeable uncertainty. The colony, despite its solvent and prosperous condition, affords no inducement to capitalists desirous of opening up new industries nor to intending immigrants. There is already in the colony more than sufficient labour to meet the demand, which is stationary, and is a diminishing rather than an expanding quantity. No land remains at the disposal of the Crown, and intending settlers must make terms with private holders. In the quality of imports there is room for improvement, and profitable employment for small capital in the importation of fruit and fresh farm produce."

But in another part of the same report it is stated, when speaking of the difficulty of carrying out necessary public works, that—

"Various circumstances militate against work being undertaken which in a country differently circumstanced would appear simple and ordinary. First and foremost is the geological formation of the group. Again, the supply of labour is extremely limited as well as unskilled, while rates of remuneration rule high, a state of affairs that is likely to obtain until the colony becomes opened up and its population added to."

* Colonial Reports—Annual. No. 235, Falkland Islands, 1897. [C—9046—3.] London, Eyre & Spottiswoode.

CHAPTER XII.

AUSTRALIA—VICTORIA.

Commonwealth of Australia—Australia—People and Towns—Victoria—
 Position—Surface—Climate—Area and Population—Communications
 —Resources—Gold-mining—Laws—Allotment of Crown Lands—
 Mining Laws—New Lands of Victoria—Gippsland—Murray District—
 Wimmera District—Irrigation “Colonies.”

COMMONWEALTH OF AUSTRALIA.

THE greater part of the continent of Australia lies in the south temperate zone, although it does not extend nearer the Pole than 40° S. In position, and to some extent also in climate and resources it corresponds with South Africa and the Argentine Republic. The seasons are opposite to those of the northern hemisphere, mid-winter occurring in June and mid-summer in December. The Australian continent differs in many respects from all the others. The watershed along the eastern edge is formed by a line of heights rising into mountains near the coast, so that the long rivers all flow towards the interior. The Darling and Murray, uniting, ultimately turn south to the ocean, but many tributary rivers dry up before reaching the main water-courses. The greater part of the interior is without outlet for its waters to the sea, and a considerable portion is an arid desert. On the south coast and in the interior the rainfall is very slight, and it is everywhere very uncertain, the average of a great many years differing widely from the average of a few consecutive years at any part of the period. In the sub-arid regions the area of grassy pasture depends entirely on the rainfall, so that what is mere desert in a dry spell becomes covered with rich grass after rain.

The peculiar Australian flora includes many varieties of Eucalyptus trees and of small close-growing woody or thorny plants known as scrub. The native fauna is equally distinctive, although the original animals are rapidly being exterminated or supplanted by animals imported from Europe; among the latter are the sheep, on which the prosperity of Australia mainly

depends, and the rabbit, the unparalleled increase of which is a worse plague in many places than drought or uncertain seasons. None of the native animals have been domesticated.

The aborigines are rapidly diminishing in number, and only remain sufficiently numerous to be a possible cause of trouble to settlers in the north and west. They are of a much lower degree of culture than the Indians of Canada or the Kaffirs of South Africa.

Australia is shared by five British Colonies, or six, if Tasmania be included. These have agreed to confederate into a Commonwealth, substantially on the pattern of the Dominion of Canada, including the insular colony of Tasmania, and at first excluding Western Australia. Federation will throw into prominence the initial mistake made by the various colonies in adopting a different railway gauge. Before through traffic is possible, much expense will be necessary in changing the gauges.

People and Towns.—Most of the population is of English birth or descent, but a special type of Australian character is in course of development. The immigration of Polynesians and Asiatics is strongly discouraged except in northern Queensland, but there is a considerable sprinkling of Europeans of all nationalities and also of Americans. The colonies are self-governing in the fullest sense of the term; they have local military forces, and contribute to the support of a special squadron of the British Navy for coast defence. British coinage, weights, and measures are in use, and the whole political and social arrangements resemble those of the Mother Country, except that there is no established church. The distribution of the population over the country is quite different from that in Canada. A relatively small proportion lives in the country, and the capital of each colony is a large town. In the case of the two most populous colonies, nearly half the population is concentrated in the capitals. This gives rise to peculiar economic conditions and has led more than once to serious financial crises. In the large towns there is an unemployed class, as in Europe, which frequently suffers great poverty and distress; but in the country those who are prepared to rough it and are not too particular as to the nature of their occupation find plenty of room and a fair chance of making a comfortable living. There is less difference of classes than in Europe, and the institutions are frankly democratic. Much of the legislation in all the colonies is concerned with the privileges of the workers, and many political and social experiments are tried. An eight-hours' day is nearly universal; local option in the regulation of drink traffic prevails, and the

marriage of a deceased wife's sister is legalised. Wages are higher, while taken over all the expenses of living are the same as in the Mother Country, the slightly greater cost of clothing and books being balanced by the cheapness of food.

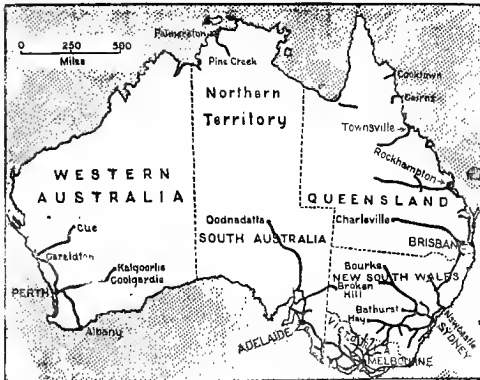


Fig. 6.—Map of Australian Colonies.*

THE COLONY OF VICTORIA.

Position.—The colony of Victoria occupies the south-eastern corner of Australia, between the Murray River and the sea, its most northerly part being in latitude 34° S. and its most southerly in 39° S. The coast line on Bass Strait has several deep indentations, of which the largest, Port Phillip Bay, is the most important. The entrance to this bay is narrow and obstructed by shoals, but inside it forms a nearly circular basin about 30 miles in diameter. Melbourne, the largest town in the colony, stands at the head of the bay in the north, and the port of Geelong is in the south-west.

Surface.—The surface of the country is, on the whole, hilly and often mountainous. The great Dividing Range, under various names, runs through the colony from west to east, the highest summits slightly exceeding 4000 feet, but the average elevation is low and the mountains are easily crossed by roads and railways. The geological formations are mainly the older Paleozoic strata, with great outbursts of volcanic rocks, which

* From *The International Geography*. London, George Newnes, Ltd., 1899.

are geologically recent, although no signs of volcanic activity have appeared in historical times. Numerous short rivers flow from the mountains to the sea, while longer streams run northward to the Murray. The Loddon, nearly on the meridian of 144° E., is the most westerly of the north-flowing tributaries which actually reaches the Murray. In the Wimmera district, which lies west of it, the rivers dry up as they flow northward or terminate in salt lakes on account of the dryness of that region. Where water abounds the soil is everywhere fertile, and in some places, particularly on the volcanic rocks of the south-east, the fertility is remarkable.

Climate.—The climate of Victoria is more agreeable to Europeans than that of any other part of the Australian continent, a fact which, combined with the rich natural resources, earned for the part of the country first entered upon its first hope-inspiring name of *Australia Felix*. The extreme summer temperature of 100° is experienced at Melbourne on the average on about four days in the year when the hot north winds blow, and on the average there are three nights in winter on which minimum temperatures below 32° are recorded, but the mean annual temperature is 57° . In the western district and on the Murray River the extremes are greater, but on the mountains much less. The rainfall at Melbourne averages 25 inches per annum, much the same as in the south-east of England, and the average for the whole colony is 26 inches. On the coast and in the hills there are a few places where the rainfall is greater than 30 inches; but in the Wimmera district and on the Murray it does not exceed 15. Everywhere there is the greatest irregularity in the rainfall, and both droughts and floods of a destructive character are occasionally experienced.

Area and Population.—Victoria, with an area of 88,000 square miles (about equal to that of Great Britain) is the smallest colony on the mainland of Australia; but its population of over 1,100,000 makes it by far the most densely peopled. The population is mainly of English origin, and 97 per cent. in 1891 were British subjects by birth. There were, in that year, only 565 aborigines in the colony, and 9377 Chinese. Strong efforts are now being made to keep down the number of Asiatics. The population of Victoria is not increasing at present although the birthrate is twice the deathrate. During the five years 1893-97 the average number of immigrants by sea was 83,000 per annum and of emigrants by sea 91,200, the latter going mainly to the goldfields of Western Australia. This indicates that as a region for exploitation Victoria is not in present con-

ditions attractive enough to retain its existing population. But, on the other hand, it must be remembered that to people coming from old countries the relatively high degree of development and the consequent comfort of life make it easier to settle in this colony than in a less developed land. Of the 56,000,000 acres which the colony contains, 11,000,000 acres,* or practically one-fifth of the land, are still unappropriated, but naturally the best land has long since passed into private hands. The population is greatly concentrated in towns. Melbourne and its suburbs alone contained 458,000, or two-fifths of the population in 1897. The only other towns exceeding 40,000 are Ballarat and Bendigo.

Communications.—Melbourne, the great seaport of the colony, is the terminus of several lines of mail steamers from Europe, and a calling place for others which go on to Sydney. The Peninsular and Oriental and the Orient lines have weekly steamers from London *via* the Suez Canal and Albany, Western Australia. The North German Lloyd and Messageries Maritimes steamers follow nearly the same route. Other lines make the longer voyage *via* the Cape of Good Hope. There are also regular lines of steamers to all ports on the Australian coast, to New Zealand, and to China.

Internal communications in the colony are good. The Murray River is navigated, though with some difficulty, by river steamers from its mouth to Wodonga. From Melbourne a well-designed system of railways, owned by the Government, radiates over the colony. The Northern line runs to Echuca, passing Bendigo on the way (156 miles), and connects with the system of New South Wales; the North-Eastern connects at Wodonga with the New South Wales line to Sydney; the Eastern penetrates the Gippsland district to Bairnsdale on the Mitchell River (170 miles); the Great Southern goes to Port Albert in south-western Gippsland, and the Western runs through Geelong and the south of the Wimmera district to Serviceton, where it joins the South Australian system to Adelaide. A number of branches serve the small sea-ports in the west, and connect the various main railways in the north. The nearly desert north-western portion of the Wimmera district is the only large area of the colony which is difficult of access.

* Emigrants' Information Office, *Victoria Handbook*, 1899 (p. 31). According to the *Statesman's Year Book* for 1900, only 23,000,000 acres are alienated.

Resources of Victoria.—Gold mining is the most important industry in the colony, judged from the value of the product raised and exported. Sheep-rearing and the export of wool come next. The value of the wool exported from Victoria usually exceeds that of the gold, but a large amount of the wool, sometimes one-half, is produced in the south of New South Wales, and only sent to Melbourne for convenience of export. Agriculture takes the third place. The chief crop is wheat, the yield per acre of which is small; but over 1,500,000 acres out of the 3,000,000 acres of cultivated land are under that crop. Fruit-growing takes a very important place amongst the minor industries, and much care has been bestowed on the culture of the vine and on wine-making. The future prosperity of Victoria seems likely to depend more and more on the production of fruit and other vegetable products congenial to the climate. Manufactures of every kind are produced in the colony, and there has long been a high protective tariff for their encouragement. The trade of Victoria is mainly with the United Kingdom and the other Australian colonies, very little being done with foreign countries. In the five years, 1893-97, the exports and imports have balanced at about £14,000,000.

Gold-Mining.—The day of individual miners making fortunes by gold-digging in Victoria has long gone by, and, since the annual output of gold in recent years has been worth about £3,000,000, and the average number of gold-miners employed is about 30,000, it is difficult to see how this industry can be profitable on the whole since wages alone, at £2 per week, amount to more than the total value of the gold. But the fact that the mines keep at work would suggest that there is some error in the official statistics.

Laws.—No government aid is now given to immigrants, and undesirable persons are not allowed to land, the laws against the introduction of Chinese being particularly strict. Hence cheap labour is not available for farms, plantations or mines. There are Factory Acts limiting the hours of labour, and the working day throughout the colony is usually eight hours, while the minimum wages to be paid in certain industries are also fixed by government authority. There is very complete local self-government, and the principle of local option is applied to the regulation of the drink traffic.

The Torrens system of registering land titles is in force, the registration of the title being the essential feature of all transfers of land.

Allotment of Crown Lands.—The unalienated Crown lands in Victoria are divided by the Land Act of 1898 into the ten following classes* :—

- (1) Good agricultural or grazing lands.
- (2) Agricultural and grazing lands.
- (3) Grazing lands.
- (4) Pastoral lands (large areas).
- (5) Swamp or reclaimed lands.
- (6) Lands which may be sold by auction (not including swamp or reclaimed lands).
- (7) Auriferous lands.
- (8) State forest reserves.
- (9) Timber reserves.
- (10) Water reserves.

Crown lands are not allotted free to settlers, but may be acquired either by purchase, payable at once or by instalments, or under various tenures of which an ordinary one is that known as perpetual lease. Land taken up in this way must not exceed 600 acres of first-class land, 960 acres of second-class land, or 1920 acres of third-class land, and it is held by payment of a small rent to government, on condition of residence, fencing, and improvement, and the destruction of vermin, which are mainly rabbits.

In the effort to relieve the unemployed in Melbourne, a system of settlement on land has been adopted which admits of payment by instalments for a small portion of land, and also authorises the institution of labour colonies where people may obtain employment at small wages and be trained for agricultural work. Such a labour colony has been established at Leongatha in the Gippsland district, 74 miles from Melbourne.

Agricultural schools for a different class (boys from 14 upwards) have been established at Dookie, near Shepparton (about 100 miles north of Melbourne), and at Longeronong, in the Wimmera district, where a course of two or three years is carried out, every alternate day being devoted to practical work on the farm.

There are land offices in all the principal towns, where application for Crown lands in the locality must be made.

Mining Laws.—By the Mines Acts of 1890 and 1897, "Miners' rights" are issued at the rate of 2s. 6d. per year, which entitle the holder to take possession of a portion of Crown land

* See *Victoria Handbook*, published by the Emigrants' Information Office, 1899, p. 31.

for mining and residence, under certain restrictions imposed by the local mining board. Gold-mining leases are issued for fifteen years at the rate of 2s. 6d. per acre, and leases for working other minerals at various rates.

The New Lands of Victoria.—The central parts of Victoria around Melbourne, and on the central section of the mountains where gold-mining has been greatly developed, are fully occupied, and in many places highly prosperous; but in the outlying portions of the colony, including the forest region of eastern Gippsland, the land near the upper waters of the Murray, and the Wimmera region in the west, there are great areas of vacant land. In some of these there are doubtless mineral deposits of value, but the chief resources of the land which may now be profitably developed are in most places agricultural. The development of agriculture and dairy farming is encouraged by the offer of bonuses by government on the export of cheese, wine, brandy, and tobacco produced in the colony. The outlying districts of Gippsland on the east, Wimmera on the west, and Murray on the north are the parts of Victoria which still remain but little developed.

Gippsland.—Gippsland is a well-watered region, rough and unfit for settlement in the mountains of the north-east, but covered on the southern slope with very rich soil. The chocolate-coloured volcanic soil is famous for the heavy crops it yields, but there is an equally fertile soil composed of the decomposed slates or shales which form the principal mass of the mountains. There is a very dense forest growth of large trees, including some of the tallest in the world, and these must be cleared at great expense before the land is fit for occupation. The cost of clearing varies from £4 to £10 per acre, and the best agricultural land when cleared is worth as much as £20 per acre, although grazing land may be sold as cheaply as £3. The south-west of the district is already occupied by general farmers and stock-raisers, the products having a ready sale in Melbourne. In the east the heavy woods and the want of roads beyond the railway terminus (at Bairnsdale) make settlement very difficult.

Sale (127 miles from Melbourne) is the centre of the best agricultural land at present in use, although there is much land in the neighbourhood still under scrub and requiring capital to clear it. Maffra (131 miles from Melbourne) is a great cattle market, and most of the land round it is used for grazing, though well adapted for agriculture. There is good dairying country on the Jack and Albert Rivers near Yarram (181 miles from Melbourne), but the industry has not yet been established.

The extreme east of Gippsland has not yet been fully prospected for mineral wealth, but gold is known to occur there. In northern Gippsland, gold-mining is carried on extensively, especially on Stringer's Creek and at Omeo (80 miles north of Bairnsdale). Coal is also mined at some points, and government encouragement is given to the enterprise, which is extending.

Murray District.—The Murray district occupies the north of the eastern half of Victoria extending from the mountains to the Murray River. It is mainly devoted to sheep-rearing, and the summers are very hot and dry. The land is in some parts suited for agriculture, but towards the west crops can only be raised successfully by means of irrigation. Government irrigation works have been established at various places, but it frequently happens that the heavy taxation imposed to pay for these improvements reduces the returns below the limits of profit. In the west are the chief vineyards of the colony, while the east is the chief tobacco-growing region. There are gold mines in operation, but, taken altogether, the region does not seem likely to attract population at present.

Wimmera District.—The Wimmera district is the most desolate and empty part of Victoria comprising the sub-arid area, with a rainfall of 15 inches and under, and occupied for over 11,000,000 out of its 15,000,000 acres by discouraging expanses of mallee scrub. The mallee (*Eucalyptus demosa*) consists of large roots from which spring a number of slender woody stems from 8 to 12 feet high and so close together that it is sometimes difficult to force a way through on horseback. The clearing of mallee land has been reduced to a 'science. The stems are broken down by specially designed rollers, then burnt, and the ground ploughed by a curious plough so constructed that the share jumps over stumps or any fixed obstacles without damage. The land which can be had in any quantity, costs from 10s. to 12s. 6d. per acre, and the clearing and first ploughing cost from 19s. to 25s. per acre. After a few crops of wheat have been taken off the land is fit to grow good grass. In the southern and less arid part of the mallee country cereals and fruit can be grown without irrigation, and the Western Railway brings that part of the district into communication with Melbourne. No artesian water is obtainable in the district, so that irrigation can only be carried out from the rivers. Small holdings in the Wimmera district have been found unprofitable, and it is generally estimated that from 600 to 1000 acres are required in order to pay under wheat, which is, as yet, almost the only crop raised. Borung and Lowan counties are the chief centres of

wheat-growing. The principal town in Wimmera is Horsham, a railway centre 203 miles from Melbourne. In its neighbourhood there are extensive Government irrigation works, and land is being disposed of in small blocks of 5 to 10 acres, with water-rights. These are well adapted for fruit-growing, an industry which is capable of great development, apricot-growing being particularly promising. At Dimboola (224 miles from Melbourne) the land is being rapidly taken up, mainly by Germans who make excellent colonists.

Irrigation "Colonies."—The irrigation works in Victoria have not hitherto proved financially successful, possibly because much money had to be spent in experiments with methods which ultimately proved unsatisfactory. A large private enterprise was started by Messrs. Chaffey in 1887 at Mildura on the Murray River, reached by steamer on the river either up stream from Morgan in South Australia or down stream from Swan Hill in Victoria, both of these points being railway termini. The irrigated land was divided into 80-acre blocks intended for fruit-growing and 160-acre blocks for other kinds of agriculture, and these were offered for sale to settlers at £25 per acre for fruit land and £15 for agricultural land. The rainfall at Mildura has varied from 6 to 22 inches a year between 1892 and 1897. In 1896 there were about 10,000 acres under cultivation by 450 resident owners, and the total population of Mildura was 4000. The *Victoria Handbook* of the Emigrants' Information Office for 1899 gives the following additional information:—"For some years the scheme appeared successful. Owing, however, to the increased difficulty and cost of irrigation, as well as to the absence of markets, the colony has hitherto failed financially. The Mildura Commission, which was appointed by the Government to inquire into the affairs of the colony, reported in September, 1896, that the insufficiency of the water supply was the principal cause of the disaster, and that the Government contributed to this result by their neglect; they recommended that the Government should advance not more than £30,000 on the security of the land to put the irrigation machinery and channels in proper order, and that the concession to Messrs. Chaffey should be cancelled, thus restoring to the Government the 188,000 acres undisposed of.

"In accordance with these recommendations a large advance of public money to the colony has been made, but the result is still uncertain."

CHAPTER XIII.

AUSTRALIA—NEW SOUTH WALES.

Position—Geology—Surface and Climate—Coast Strip—Elevated Table Lands—Western Plains—Area and Population—Communications—Resources—Irrigation—Rabbits—Laws—Crown Lands—New Lands of New South Wales—Riverina District—Prospects for Farmers—Minerals—Forests and Fisheries.

Position.—New South Wales was the name originally applied to the whole of eastern Australia, but limited, after the separation of Victoria in the south and Queensland in the north, to the central portion from the Murray River to latitude 28° S. The western boundary is 141° E. There is a much-indented sea coast on the Pacific, in which the magnificent harbour of Port Jackson concentrates the import trade of the colony in the capital, Sydney. The only other important seaport is Newcastle at the mouth of the Hunter River, an indifferent harbour although a very busy port.

Geology.—The geological formation of the colony shows a predominance of the most ancient sedimentary rocks, with volcanic intrusions in the east. Large areas of the Coal Measures occur, from which coal is profitably mined, and there is great variety in the mineral wealth. In the west the plains are mainly formed of a more recent sandstone, under which large stores of underground water are accumulated, which in many places can be brought to the surface by means of Artesian wells.

Physically New South Wales is divided into three parts—the Coast Strip, the Elevated Table Lands, and the Western Plains.

The Coast Strip.—The Coast Strip slopes from the base of the mountains of the Dividing Range, which runs from south to north at a distance varying from 30 to 120 miles from the sea. These mountains attain heights of from 4000 to 7000 feet, and in some parts their seaward slopes are extremely steep, so that much difficulty was experienced by the early settlers in crossing them. Short rivers liable to great floods during rainy

weather cross the Coast Strip to the sea. The mountains are known by different names in different parts of the Dividing Range, and in the north of the colony they trend east and west in the New England and Liverpool ranges. The Coast Strip includes about 50,000 square miles. Its climate is sub-tropical in the north, but less hot and moist in the south. At Sydney the mean annual temperature is about 63°, the coolest month, July, is only 10° colder, and the hottest, December, about 10° warmer; but on a few very rare occasions snow has been known to fall in winter, and on the average there are four or five days in summer when the thermometer rises above 100° and a hot, dust-laden wind blows from the interior. The driest months are from September to December, and the average annual rainfall is about 50 inches. In the north it exceeds 60 inches at some points, but in many places in the south is as low as 36 inches. The many rivers have formed a belt of fertile alluvial soil along the coast.

The Elevated Table Lands.—The second great natural region is that of the elevated table lands stretching westward from the Great Dividing Range, in some places indeed forming the summit of these mountains. The breadth of this region above 2000 feet averages about 70 miles, and the descent westward is very gradual. This region is much cooler than the coast at all seasons, and snow lies in the higher parts for a considerable time in winter. Even in the extreme north the temperature on the table land in the New England Plains is no higher in summer than that at Sydney. The rainfall is much smaller than on the coast; at Bathurst (2100 feet) it is 25 inches; and at Armidale in the north (3300 feet) it is 33 inches, but in the south it is drier.

The Western Plains.—The western part of the colony, as far as the boundary line of 141° E., becomes progressively lower in elevation and more extreme and drier in climate. The summers are much hotter than in Sydney, thermometer readings exceeding 120° in the shade having been recorded, while the winters are cooler. The rainfall over this whole region is under 20 inches per annum, and at Wentworth as low as 12. Severe droughts are frequent, and sudden floods covering large areas of the low ground along the rivers also occur, although more rarely. The rivers both of the Table land and the Western plain flow towards the Murray. The innumerable streams from the northern half of the New South Wales Dividing Range converge to the Darling River above Bourke (lat. 30°, long. 146°), and the river flows thence to the Murray near Wentworth

(lat. 34°, long. 142°), with only one additional tributary, coming from the north. The southern section drains by the Lachlan, Murrumbidgee, and other rivers to the Upper Murray. A great area in the centre between the Lachlan and the Darling is entirely devoid of running water; and west of the Darling there are only fragments of rivers, torrents flowing from the low Gray and Barrier mountains, and drying up in the surrounding arid plains.

Area and Population.—The area of New South Wales is 310,700 square miles, with a population of about 1,300,000, the density of population being, on the average, 4 to the square mile; but, of course, very large areas are entirely without inhabitants. The number of Aborigines, including half castes, in 1891, was about 8000, and is steadily diminishing. These people do not occasion any particular trouble to settlers. The general population of the colony is of British descent. In 1891 those born in the colony made up 65 per cent. of the population, those born in other parts of Australia and in the United Kingdom 31 per cent., so that only 4 per cent. of the population were of foreign birth. Of these the Chinese were the most numerous, and Germans came next. The landing of the former has been practically forbidden by the imposition of a poll-tax of £100 on Chinamen, and by a law that no immigrants are admitted to the country who are unable to write a European language. As a result, for every Chinaman who has entered New South Wales since 1892, at least nine have departed. The usual rules are in force as to the prohibition of destitute or useless immigrants of any nationality. The excess of immigrants of all kinds over emigrants averages about 8000 per annum, and as the births average 38,000, and the deaths only 15,000 per annum, the population is increasing from all sources at the rate of about 31,000 a year, or about 4 per cent. Assisted immigration has been entirely given up, and although there have been severe financial crises in the cities, and frequent disasters from drought or floods in the country, the general condition of New South Wales is one of assured prosperity. The *New South Wales Handbook* of the British Emigrants' Information Office (1899) says of life in the colony:—"Wages are high, the recognised working day in skilled trades is eight hours, and in no country outside the Australian colonies is the political and social status of the working class on a higher level. A New South Wales writer says—"The people of New South Wales eat and drink and spend more, work less for the necessities of existence, have a larger share of food luxuries, and in a general way get

more out of life than the masses of any other country in the world."

As in Victoria, the population is far too much concentrated to be satisfactory from the point of view of the development of the country, the population of Sydney being estimated in 1897 at 417,000, or nearly one-third of the total inhabitants of the colony. Newcastle, the second town in size, approaches 20,000, and Broken Hill, in the extreme west, exceeds 15,000 (the population being due in both cases to mining industries), while Parramatta, Goulburn, and Maitland all have over 10,000 inhabitants.

The total area of New South Wales is 198,800,000 acres, of which, up to the end of 1898, 46,400,000 acres had been permanently alienated by the State, while 127,600,000 acres were occupied under leases of various kinds, so that only about 25,000,000 acres remain unoccupied.

Communications.—Sydney, on Port Jackson, is the heart of the colony, and the centre of its lines of communication external and internal. It is the terminus of the lines of ocean steamers from Europe, not only those mentioned on p. 193 (under Victoria) which touch at Melbourne (700 miles or 50 hours from Sydney by sea, 576 miles or 18 hours by rail), but also for the liners which come from Europe by Torres Strait and call at the Queensland ports on the way. In addition, there is a direct line of the Canadian Pacific Railway steamers between Sydney and Vancouver, a line to San Francisco, and other lines to China, as well as regular trade with New Zealand and the islands of the Pacific.

The internal communications do not as yet form a complete system, some parts of the country being more readily approached from the neighbouring colonies than from Sydney. For instance, the private railway from Moama on the Murray River (with rail from Melbourne) to Deniliquin; and that from Cockburn on the western frontier (with rail from Adelaide) to Broken Hill. The other railways are all connected with Sydney and are the property of the State. The Southern line runs from Sydney along the base of the mountains to Goulburn (134 miles), whence it crosses the Dividing Range and proceeds westwards and southwards to Albury (386 miles from Sydney) where it meets the line from Melbourne. There are numerous branches, the longest terminating at Hay on the Murrumbidgee River (454 miles from Sydney).

The Western Railway crosses the Blue Mountains by some fine examples of engineering work, and, passing Lithgow (95

miles from Sydney) and Bathurst (144 miles), crosses the great plain north-westward to Bourke on the Darling (503 miles). It also throws out several branches tapping the pastoral plains in various directions.

The Northern Railway runs to Newcastle (102 miles from Sydney), then turns north-west, and again northward at a distance of nearly 100 miles from the coast to Jennings on the Queensland boundary, 490 miles from Sydney, and 233 miles to Brisbane. The whole journey from Sydney to Brisbane occupies about thirty-six hours.

The system of stage-coaches is remarkably complete for so large and thinly-peopled a country. All the railway termini in the west are connected in this way, and coach roads from Hay, Bourke, and other points on the railways converge on Broken Hill (830 miles from Sydney). Most of the rivers are navigable during the rainy season, and river traffic on the Darling is carried on for over 1700 miles from Wentworth to Walgett, about 200 miles (by river) above Bourke. The Murrumbidgee and Lachlan are navigable for 900 miles, and the Murray for 1100. But the navigation is very uncertain; a voyage between two points may take days one season and weeks or even months another, while, occasionally, several years have elapsed without a steamer being able to run on account of a long spell of drought.

Resources.—The main resources of New South Wales are pastoral and mineral. Agriculture is developing and manufactures beginning. The great wealth of the colony is in its flocks, the number of fine-wooled sheep (mainly merinos) being greater than in any other colony. Although the number is exceeded by Argentina, the quality is not approached. In December, 1897, there were nearly 44,000,000 sheep in New South Wales; but on account of losses through exceptional drought this figure is less by 18,000,000 than in 1891. The districts containing most sheep are those in the north and along the Darling River. Much of this land is so poor that ten acres or more are necessary to supply food for each sheep, hence the sheep-runs are of enormous extent. Comparatively few sheep-owners have more than 100,000 sheep each, the great majority owning less than 2000. The export of wool from the colony averages about 300,000,000 pounds weight, worth £9,000,000 per annum, making up more than half the value of the exports of home produce. Tallow, hides, leather, and meat—other products of the pastoral industry—add about £2,000,000 to the exports. The rest is made up mainly of mineral products, especially gold (coined at Sydney), silver or silver-lead ores, and coal. Agricul-

tural products do not figure largely amongst the exports ; and of the land fit for agriculture only a very small portion has yet been utilised. Still, the tendency is for general farming to extend and encroach on the best part of the pastoral land, and this will undoubtedly lead before long to a very great development of the resources of the country.

Irrigation.—At present the discovery of sources of water supply and the planning of storage and irrigation works are by far the most important means of developing New South Wales. The whole western district and most of the central district are semi-arid. Irrigation (together with the cultivation of fodder plants) has been found to reduce the area necessary for pasture from ten acres to one-twentieth of an acre per sheep. It has made it possible to raise heavy crops in places where a harvest could only be obtained naturally once in several years, while without artificial supplies of water it is impossible to prospect, much more to work, many of the mineral fields which geological evidence points out as likely to prove valuable. Hence the underground waters must be looked on as one of the most precious resources of the country.

With rare exceptions the development of New South Wales depends more on the judicious expenditure of capital than is the case in many new countries, and large land-holders have many advantages, in dealing with sub-arid country, not enjoyed by those in possession of small holdings.

Rabbits.—As a set-off to the readiness with which sheep, horses, and cattle have become habituated to the pastures of Australia, we must consider the terrible increase of rabbits, which in most parts of New South Wales swarm in millions. Enormous sums of money have been spent in futile efforts to exterminate the pest ; but the only effective measure has been found to be the erection of rabbit-proof fences, of which 17,000 miles had been constructed up to 1898. The rabbits are ruinous to the sheep-farmers by eating down the grass and so starving the sheep.

Laws.—As in Victoria, the legislation with respect to immigration is designed to protect the colony against undesirable immigrants rather than to encourage a great influx of population. Chinese and other Asiatics are severely restricted, cheap labour not being looked upon as a necessary condition for development.

New South Wales has always been distinguished from the other Australian colonies by its very low tariff, and for the last few years it has practically enjoyed free trade, duties being

levied only on such things as liquor and tobacco. Consequently, living in the towns is, on the whole, no more expensive than in England, and most food materials are considerably cheaper in the colony than at home.

The area under the local government municipalities is comparatively small, though it embraces more than half of the population. Over the greater part of the colony the population is so widely scattered at remote sheep-stations that no form of local government is possible. In some respects the restrictive laws are more lenient than in the United Kingdom. Vaccination is not compulsory, and marriage with a deceased wife's sister is legalised as in other colonies. There is a form of local option in force, and public-houses are closed on Sunday. Factory and mining acts limit and safeguard the employment of women and children in factories, and prohibit their employment in or about mines.

The miners' licence, or authority to dig for gold or other minerals, costs only 5s. per annum.

Crown Lands.—The disposal of Crown lands is the subject of much legislation, and there are several forms of tenure. The three great land divisions of the colony, Eastern, Central, and Western, are divided into 80 land districts under the charge of 89 Crown Land Agents, who give all information and receive applications for the purchase or lease of public lands. The following are the land regulations affecting intending occupiers as summarised by the Emigrant's Information Office* :—

"The *Eastern Division* has an area of 60,452,000 acres, and includes the coastal district of the colony, as well as the northern and southern table lands. The *Central Division* includes an area of 55,460,000 acres, and embraces the upper basin of the Darling River in the northern part of the Colony, and portions of those of the Lachlan, Murrumbidgee, and the other affluents of the Murray. The Central Division has been hitherto mainly pastoral, but much of it is suitable for agriculture. The *Western Division* embraces an area of 79,970,000 acres, watered entirely by the Darling River, and is purely pastoral.

"Conditional purchases may be obtained in the Eastern and Central Divisions by any applicant who is of or over the age of sixteen years. The price of the land is £1 per acre, 2s. per acre being deposited on application, with a survey fee, and the rest paid by instalments of 1s. per acre per year (which by the Act of 1896 may be reduced to 6d.), together with interest at 4 per

* *Handbook for New South Wales*, 1899, pp. 30-32.

cent. on the unpaid balance: the instalments to begin at the end of the third year. The applicant must within three months of confirmation of application by the local land board commence *bonâ fide* residence and continue it during ten years. He must within three years of confirmation fulfil certain conditions as to fencing; or substitute other improvements to be approved by the local land board. Holders of conditional purchases may make additional conditional purchases adjoining their holdings, provided the same, with their original purchases, do not exceed 640 acres in the Eastern and 2560 acres in the Central Division.

"Applicants of the age of twenty-one years and upwards may apply for Crown lands in the Eastern and Central Divisions, without conditions of residence, in quantities not exceeding 320 acres; the deposit and other payments are double those in the case of conditional purchases proper, the fencing must be performed within twelve months, and £1 per acre must be expended in improvements within five years after the date of confirmation of the application for such purchase.

"Every residential conditional purchase in the Eastern and Central Divisions carries with it the right of taking up a conditional lease of land adjoining the conditional purchase, not exceeding three times the area thereof, if available. The area of the entire holding, however (both purchased and leased), must not exceed 1280 acres in the Eastern and 2560 in the Central Division; the term of the lease is twenty-eight years.

"*Annual leases* of unoccupied land may be obtained in any land division at a rent not less than £2 per 640 acres or any less area.

"*Special areas* may also be reserved from the operations of the ordinary conditional purchase clauses of the Act, and may be thrown open to selection under different terms as to payment, and with or without the condition of residence. But in such special areas the price of the land cannot be less than £1 10s. per acre, or £3 if the purchase be non-residential, and the maximum area of one such purchase is 320 acres in the Eastern, and 640 acres in the Central and Western Divisions.

"In the Western Division the term of a pastoral lease extends to 28 years upon an assessment made for seven years, and a reassessment made every seventh year of the lease's currency.

"Occupation licences may be obtained in any division for resumed areas or vacant land. They are to be granted preferentially to a run-holder over the resumed area of his run. They are to be granted for each year ending December 31, and the rates, when appraised, are to be published.

"In the Western Division homestead leases may be granted within resumed areas or of vacant land in areas not less than 2560 acres, nor exceeding 10,240 acres, for a term of 28 years, the lands to be appraised every 7 years. The lessee must fence, within two years of occupation, with a fence according to a prescribed design, and the holder must reside upon the land for at least six months of each of the first five years of the term; but the land board may grant a postponement of the fencing and residence."

In the case of scrub-lands and snow-lands (*i.e.*, the elevated regions where some snow falls in winter) there are special regulations involving, in the former case, the systematic destruction of the scrub.

Homestead selections may be granted in any part of the colony on lease, the area not exceeding 1280 acres. The conditions exacted are the building of a house, residence, and, in certain cases improvement of the land. The rent is fixed for the first five years at $1\frac{1}{2}$ per cent. of the notified capital value of the block, for the next ten years at $2\frac{1}{2}$ per cent., and after that at $2\frac{1}{2}$ per cent. of the re-appraised capital value. Many hundreds of these homestead selections have been taken up in the Eastern and Central Divisions.

The New Lands of New South Wales.—In the far west pastoral leases cover most of the country, and there is probably no part of the world where such extensive areas are "occupied" profitably by so small a population. There is a great future in this region for irrigation from artesian wells. These have to be bored to a great depth, the water-bearing strata being usually struck between 1000 and 2000 feet. Bourke is one of the greatest centres for pastoral products, and there are copper mines in the neighbourhood. Wilcannia, lower down the Darling River, reached by coach from Hay, is another centre for sheep-rearing; but the whole of the country round both of these places, and all to the west, are too dry for agriculture. Irrigation farms supplied from wells would pay well even for the growth of hay, as very often there is the greatest difficulty, when the Darling River is too low for navigation, in procuring fodder for the coach-horses. Camels are now kept in considerable numbers for purposes of transport. Ostrich farming would probably be found profitable, if the initial difficulties of establishing the birds could be overcome. Opals occur in great abundance at White Cliffs, about 60 miles north of Wilcannia, and in 1898 there were 700 miners at work collecting them. Another opal field lies about 40 miles further to the north-east

at Purnanga, and, although it is yet undeveloped, it is said to be very promising. The drawback to opal-mining, as to alluvial gold-mining, is want of water.

The most valuable mineral deposits of the Western Division are the silver-lead ores of the Barrier Ranges, which are worked on a very large scale at Broken Hill. Here, however, there does not seem to be much chance for fresh enterprise, unless new bodies of ore are discovered in the mountains further north.

Riverina District.—The Riverina District in the south of the colony, between the Murrumbidgee and the Murray Rivers, is being gradually converted into agricultural country, although it still contains a great number of sheep. Its chief town is Deniliquin, and the produce of the district finds a nearer and more convenient outlet through Melbourne than through Sydney. There are many places on the Lachlan River—especially in the neighbourhood of Forbes, which has railway communication with Sydney—where there is good Crown land still available which is adapted for agriculture.

Prospects for Farmers.—There are few parts of the Eastern Division except in the immediate vicinity of Sydney, where an energetic farmer could not find room, and if provided with a capital of from £500 to £1000, make a very comfortable living. The nature of the crops would, of course, have to depend on the position. The ordinary grains and roots of Europe thrive best on the uplands of New England in the north, and along the plateau wherever the rainfall is sufficient. On the coast in the north maize and sugar-cane are staple crops, although the want of cheap labour is diverting attention from the latter. The want of cheap labour would probably make it very difficult to introduce tea-growing, for which the well-watered Coast District would seem to be adapted, and as the Australians are the greatest tea drinkers in the world there would be a great home market. Orange-growing is largely carried on in the central part of the coast strip, and many other varieties of fruit congenial to the warm temperate zone can be raised.

There is an agricultural college at Richmond, 38 miles north-west of Sydney, where students from 16 to 25 years of age are instructed in the theory and practice of farming. No better introduction to a settler's life could be obtained by a young man from the old country than a course at this college before commencing on his own account. South of Sydney the coast belt is becoming very important for dairy farming, and butter has already become a valuable export. The establishment of butter

factories on modern principles has opened up a field which is sure to be very considerably developed.

Minerals.—In the Eastern Division the mineral resources are of very great value, and there is still scope for the prospector in many districts where minerals are known to exist although their amount and value can only be guessed at. Gold, both alluvial and in quartz, is scattered widely over the east of the country, the alluvial workings are attracting less attention every year, and the quartz mines more. But gold-mining, judging from the statistics published, does not pay. The yield of 1897 was worth £1,088,000 and the number of gold miners is given as 21,286, so that the average earnings would appear to be less than £1 per week, without considering any return on capital expended.

The coalfields of the Eastern Division are estimated at 24,000 square miles in area, and at only a few points are mines actively worked. Over 4,300,000 tons were raised in 1897, chiefly from the Newcastle mines and at the mines of Bulli in the Illiwarra district south of Sydney, and at Lithgow in the west. Iron ore and limestone abound, but there is only one place where iron is manufactured in the colony—at Lithgow. Gold, copper, and tin (the last named mined in the north-east, but in diminishing quantities) are smelted; but the metallurgical works are not in proportion to the mineral wealth.

New South Wales could be made an absolutely self-supporting community requiring no imports except luxuries, and in the steps towards achieving this position the most important would seem to be the manufacture of iron on a sufficient scale for home requirements, the construction of machinery, and the establishment of textile factories. At present over £600,000 worth of woollens are imported annually from the United Kingdom. Although the free trade policy of the colony has prohibited protective duties, the heavy freights on all goods imported from Europe or America necessarily raise prices, and give local manufactures a chance to develop. This is particularly the case for woollen goods, where the raw material has already paid freight from Australia to England.

Forests and Fisheries.—The Eastern Division contains large quantities of timber, some of it, like tulipwood and rosewood, being fit for the finest decorative work, while the cedar is useful for all purposes. A Forest Department has been established and forest reserves proclaimed. There are many sawmills, yet, apparently, the timber industry is not fully developed, as a great deal of wood is imported.

Another industry which is in a very backward state is fishing. The coast of New South Wales abounds in excellent harbours, and there is a potential market in the great aggregation of population in Sydney which should keep many hundred fishermen in constant employment. The neighbouring sea abounds with food-fishes of high quality, such as the Australian schnapper, rock-cod, whiting, mackerel, mullet, and garfish. Oysters are also abundant. The retail fish trade appears to be mainly in the hands of Italians; but this is a trade which might be enormously developed, and with a relatively small expenditure of capital.

CHAPTER XIV.

AUSTRALIA—QUEENSLAND.

Position and General Character—Climate of Temperate Queensland—Area and Population—Labour Question—Assisted Immigration—Mineral Resources—Agriculture—Land Laws—Mining Claims—Railways of Temperate Queensland.

Position and General Character.—Queensland extends for a distance of 1300 miles from north to south, filling the north-eastern corner of Australia from 11° S. to 29° S. latitude. It is thus mainly a tropical country corresponding in position almost exactly with India in the northern hemisphere. But while the parts of India which extend into the temperate zone occupy low land of very trying climate (the valleys of the Ganges and Indus), the temperate portion of Queensland adjoining New South Wales is part of the eastern plateau of Australia, and the colony as a whole is the healthiest tropical country in the world. The long coast line on the Pacific Ocean is bordered by the Great Barrier Reef of coral which is separated from the shore by a navigable channel, but can only be crossed from the sea at a few places. The seaports of the colony have sprung up opposite the passes in the reef, and from each of the principal ports a railway line runs straight into the interior for some distance. The chief ports of the southern district are Brisbane and Rockhampton (on the tropic of Capricorn), each situated near the mouth of a large river. The land between these consists first of a low coast strip, then the steep edge of the Great Dividing Range followed towards the west by branching ranges and plateaux which finally sink towards the low plain of the interior. This is the only part of the colony which comes within the scope of this book, and it may be further limited by leaving out of account the arid plain of the interior, in which intense heat and want of water make exploitation of any kind exceptionally difficult.

Climate of Temperate Queensland.—The climate of the southern plateau is equable, and not too hot for working out of doors in comfort. Frost is scarcely known, and the rainfall,

though capricious as in all parts of Australia, is usually sufficient. On the coast the heat in summer is much greater than on the plateau, and the rainfall heavier. The mean temperature of the year at Brisbane is 68° F., and the total annual rainfall 51 inches. The average temperature of the month of January is about 78°, and of July about 58°. Temperatures of 100° or over rarely occur in the south of Queensland, except on the western plain. It will be seen from these figures that even temperate Queensland is not cool, but on the Darling Downs it may be said generally that, while the coldest month (July) is similar in temperature to April or October in central England, the warmest month (January) is on the average nearly ten degrees warmer than the hottest month in England. Except for hard field work, Europeans experience no particular difficulty from the climate in any part of Queensland, other than the extreme north and the margin of the Gulf of Carpentaria.

Area and Population.—Queensland has an area of 668,000 square miles, or nearly 428,000,000 acres; while its population amounted in 1891 to only 393,700, but was estimated in 1898 at 493,000. The population is growing by the surplus of births over deaths at the rate of about 8700 a year, and by the excess of immigration over emigration at the rate of about 4000 a year, these figures being averages of the five years 1893-97. Although fully one-quarter of the population resides within ten miles of the centre of Brisbane, the people as a whole are more uniformly scattered over the country than in the other colonies. The labour problem is very serious in the plantations of the coast belt where coloured labour of some kind is a necessity. The aborigines of the country remain in considerable force in the interior, their numbers being variously estimated at between 12,000 and 20,000. Many are employed by the squatters as servants, though they rarely prove satisfactory; but the majority remain as wandering tribes. The wild blacks occasionally harass the flocks, and are regarded with great disfavour by the settlers. Reports of systematic cruelty perpetrated by white settlers on the blacks have been made by eye-witnesses whose testimony on other matters is generally accepted as credible; but official reports affirm that much humanity is shown to aborigines.

Labour Question.—In 1891 there were over 8500 Chinese in the colony, mainly occupied on the goldfields, and about 9000 kanakas or natives of the neighbouring Pacific Islands employed on the plantations. At one time it was asserted that the importation and treatment of the kanakas differed little from slave trade, and after a period in which their immigration was

prohibited entirely, the necessities of the case caused it to be resumed, but under strict regulation. These labour questions mainly affect the part of the colony north of the tropic, and have led to a feeling in favour of a legislative subdivision of the colony.

Assisted Immigration.—The importance of increasing the number of white inhabitants has induced the Queensland Government to continue the system of free or assisted passages for desirable immigrants, which formerly prevailed in all the Australian colonies. Free passages are offered by the Queensland Government only to farm labourers and female domestic servants between the ages of 17 and 35; while assistance towards the cost of the passage may be given to "small capitalists," farmers, market gardeners, dairymen, fruit growers, and their families. The recipients of this assistance are selected by the Agent-General for Queensland, 1 Victoria Street, Westminster, S.W., from the applicants. Nominated passages are also given to persons who have relatives or personal friends in the colony. The friend must apply for a nominated free passage to the Queensland Government, and make a small payment, varying from £1 for a girl under 12 to £8 for a man or woman over 40 and under 45. These nominated passages are only given to female domestic servants, ploughmen, gardeners, and farm labourers, who must pledge themselves to remain in Queensland for at least one year. The fact that this encouragement is given to immigration is in itself evidence that the resources of the country are much in need of population to develop them.

Mineral Resources.—The chief resources of Queensland at present are gold, wool, preserved meat, and sugar. The gold-fields occur in all parts of the colony, and it is probable that many valuable deposits remain still undiscovered. Judged by the average return per miner, the Queensland goldfields are much more profitable than those of Victoria or New South Wales. In 1897 there were 12,000 gold-miners, and an output of over 800,000 oz., valued at about £3,000,000, which is at the rate of £250 per miner. Each gold-miner has to obtain a "miner's right" by paying an annual sum of 10s. The Mount Morgan Mine in the Rockhampton district has been one of the richest in the world, and still produces more than one-third of the total gold yield of the colony, the second place being taken by the goldfields of the northern districts.

Copper, tin, and silver are all mined in different places, but not very energetically, the amount raised gradually declining

from year to year. The coal-measures cover a large area, but as yet the amount of coal raised is under 400,000 tons a year. The coal mines at present worked are near Ipswich, about 20 miles from Brisbane, at Howard, near the seaport of Maryborough, and at Clermont, about 230 miles north of Rockhampton. The discovery of new deposits of workable minerals is encouraged by the colonial government, which offers large premiums for new goldfields.

Agriculture.—The coast-plain of all parts of Queensland is favourable for sugar-cane growing, the cultivation of tropical fruits, and the keeping of cattle. The pasturing of sheep is confined to the table-lands, and concentrated in the south. The number of sheep in recent years has averaged 19,000,000, and that of cattle 6,500,000. Drought on the western plains has proved very destructive to sheep; but the country is exceptionally suited for irrigation by means of bores. In 1899 there were nearly 400 artesian wells in the colony sunk to depths averaging 1200 feet, and in one case exceeding 4000 feet. As a rule, the pastoral industry is in the hands of wealthy squatters owning very large flocks and occupying an immense area of land.

Agriculture in the temperate plateaux is steadily extending, and, as a rule, the holdings are small. The rich loam soil of the Darling Downs is particularly suited to the growth of wheat; maize is the chief grain crop of the coast-plains and the north. The cost of good land suitable for market gardening near towns is high; but there is plenty land available within reach of the railways. The fact that considerable quantities of flour, barley for malting, oats, and potatoes are imported from New South Wales and Victoria shows that farming has not kept pace with the demands for farm products. All of these crops can be produced abundantly in the southern table-lands. As in the other colonies, there is an agricultural department, and there is also an agricultural college (at Gatton) where practical training can be obtained. The Department of Agriculture at Brisbane is always ready to advise farmers, especially new-comers, as to the position of the best agricultural land available and the proper crops to cultivate in the various districts.

Rabbits have appeared in some districts, but in these fencing is compulsory, and hitherto they have been restrained so as not to become a pest.

Land Laws.—The legislation of Queensland as regards the exploitation of the land is similar to that of the other Australian colonies, except that there are special laws regulating the employment of coloured labour. There is a protective tariff,

and great efforts are made by the Government to develop manufacturing industries, which, as yet, can only be said to be beginning. Although only a small part of the land has been alienated from the Crown the greater part of the colony is leased as sheep-runs to large pastoralists. From time to time, however, large areas of these leased lands are made available for settlement by a proclamation that they are open for selection. The selector has to apply to the land agent of the district, and selection must not exceed 1280 acres for agricultural land. It is held on lease, the rent being one-fortieth of the purchase price which is not less than 10s per acre, and after having occupied and improved the land for a certain time, the selector may make it his absolute property by paying the balance of the purchase price, the rent counting as instalments paid towards the total. Land may also be bought outright. Grazing leases are granted at a rent commencing at $\frac{1}{2}$ d. per acre with or without the option of purchase, and the maximum that can be secured by one individual is 20,000 acres, or over 30 square miles. Special arrangements are made for the supply of land to co-operative and self-governing communities of not less than 30 persons, and subject to certain conditions the Government may grant loans in aid of initial expenses of settlement.

Mining Claims.—Mineral lands are subject to special conditions. In the case of gold, each proclaimed goldfield is placed under the supervision of a warden, who is usually a police magistrate, and claims are registered by him. Auriferous land is leased at the rate of £1 per acre for 21 years. Claims for dry alluvial diggings are 50 feet square, two persons may have between them an area of 50 by 100 feet, and four an area 50 by 200 feet. In wet alluvial diggings two persons may have 100 feet square, and four an area 100 by 200 feet. A quartz claim measures 50 feet on the line of stone reef with a width of 400 feet, and not more than six such claims can be secured by any one party (of six men).

Other mineral lands can be obtained from the Crown on lease for 21 years, renewable for 21 years more, and the rent charged is 10s. per acre.

Railways of Temperate Queensland.—From Brisbane, the capital and chief seaport of the colony, the Southern and Western Railway runs westward for 485 miles to Charleville, a centre of sheep-farming, and the site of one of the most productive artesian wells in Australia. Just west of the Dividing Range a line turns south across the Darling Downs to Wallangarra (233 miles from Brisbane), where it joins the New South

Wales Railway. The line northwards along the coast does not quite reach Rockhampton, with which communication is mainly carried on by sea. Rockhampton is the terminus of the Central Railway, which runs westward just south of the tropic for 427 miles to Longreach. These parallel east and west railways are 200 miles apart, and are not yet connected by branch lines at any point. From one or other of these lines access may be had to all the parts of the colony where the climate is not too hot for ordinary European methods of farm work, and information as to the areas where selections may be made can always be got from the Agricultural Department in Brisbane.

Fuller particulars on most of the questions referred to will be found in the *Queensland Handbook* of the British Emigrants' Information Office, and all data and statistics in the various Queensland Government Reports.

CHAPTER XV.

AUSTRALIA—SOUTH AUSTRALIA.

Area—Northern Territory—The Province of South Australia—Climate—
Population—Pastoral Resources—Agriculture—Minerals—Conditions
and Prospects.

Area.—The colony of South Australia was originally formed round the inlets which indent the south coast, but its limits were afterwards extended to include the whole central belt of Australia, as far as the north coast, the whole area being over 900,000 sq. miles. The portion of South Australia north of 26° S., with an area of 523,000 sq. miles, is called the Northern Territory; south of that, the part where the original colony was formed, is known as the Province of South Australia, and has now an area of 380,000 sq. miles.

Northern Territory.—Northern Territory is a tropical country, a desert for the most part, but covered with jungle and forest near the coast. It is inhabited by about 20,000 aborigines, some of the tribes being dangerous to strangers, and of the settled inhabitants, numbering about 5000, fully three-quarters are Chinese.

The entrance to the region is by Palmerston, the seaport on Port Darwin in the north; but there is a project of completing a railway from south to north, following the line of the overland telegraph wire.

Northern Territory is a region of valuable mineral resources, but is not adapted for exploitation by white men for many years to come, and will not be further noticed here.

The Province of South Australia.—The original colony termed the Province, adjoins Victoria and New South Wales, and stretches westward along the coast to meet Western Australia at the head of the Great Australian Bight. The eastern part of the coast is deeply indented by the Gulfs of Spencer and St. Vincent, which are separated by a long narrow peninsula, off which lies Kangaroo Island, about 90 miles long, the largest island except Tasmania connected with the continent of Australia. East of Spencer Gulf ranges of hills run from

south to north, their highest summits (Mt. Lofty and Razorback) reaching respectively 2330 and 2830 feet. Parallel with these the Flinders Mountains run northward from Yorke Peninsula. The valley between these ranges drains partly south to the Gulf of St. Vincent, partly north to the salt lake Torrens, and partly west through gaps in the range to Spencer Gulf. West of the head of Spencer Gulf the Gawler Range runs westward south of the salt lake Gairdner, and northward the land is low, enclosing many salt lakes which collect the scanty drainage of the arid northern region and have no outlet to the sea. The only river of importance in the colony is the lower part of the Murray, which enters the sea through a lagoon called Lake Alexandrina, the entrance to which from the ocean is difficult for steamers. The coast west of Spencer Gulf along the Great Australian Bight is formed by a continuous line of lofty cliffs and apparently has no openings fit for harbours.

Climate.—The climate of South Australia is everywhere hot in summer, and only on the higher hill ranges is it cold enough for snow to appear in winter. The average temperature at Adelaide, the capital and largest town, is 75° for the hottest month, January; and at Port Augusta at the head of Spencer Gulf it is 80° . In July, the coolest month, the average temperature is about 52° in Adelaide and 53° at Port Augusta. The climate as a whole thus resembles that of Italy rather than that of England. Rainfall is more scant and fickle than in most parts of Australia. The mean annual rainfall exceeds 20 inches only in the extreme south of the peninsulas, and along the mountains stretching northwards past Adelaide. At Adelaide itself the annual rainfall is about 21 inches, but on the Mount Lofty range it exceeds 30 and in a few places 40 inches. In the north, however, in the lowlands near the salt lakes the mean annual rainfall is less than 7 inches, and the question of regulating the water supply is more urgent than in the eastern colonies. Most rain falls in winter—i.e., from May to September.

Population.—Exclusive of Northern Territory the population of South Australia was 315,000 in 1891, and of this number one-third lived within a ten-mile radius of the centre of Adelaide. The country is thus very thinly peopled indeed, the area of "the Province" being 380,000 square miles.

The population is increasing very slowly, and entirely by the excess of births over deaths. In the five years, 1893-97, the emigration from South Australia has exceeded the immigration by an average of 1600 per annum.

Pastoral Resources.—The products of the country are mainly pastoral, the chief exports being wool and hides. In 1897 there were about 5,000,000 sheep and 274,000 cattle, but in 1891-92 the numbers had been 7,150,000 sheep and 412,000 cattle. The average area of pasturage required for each sheep in the best part of the colony—*i.e.*, in the settled counties—is 10 acres. The Emigrants' Information Office's *South Australia Handbook*, 1899, says :—"The Pastoral Commission, which was appointed in 1897, reported in 1898 that the pastoral industry is, and has been for many years, in an extremely depressed and unsatisfactory condition. Drought has destroyed large numbers of sheep during the last few years, and has been the main cause of the great depression of the pastoral industry. It is hoped that by the sinking of artesian wells, the storing of water, and irrigation, the danger of drought may be, to some extent, obviated. The rabbit plague also causes great loss, especially along the Murray Flats, and wild dogs have become an increasing danger. Rents, moreover, have been high, and prices of wool and stock have been low."

Agriculture.—Agriculture is important in the counties, but is not practised beyond them ; and in 1897-98 there were in all 2,600,000 acres under cultivation, considerably more than half being under wheat, which constitutes one of the leading exports. Wheat-growing is not, however, extending, and on account of the low rainfall the yield is extremely small, the average for ten years varying from 1·7 to 8 bushels per acre. Hay, barley, oats, and potatoes are the other farm crops usually grown. It is more profitable to grow fruit, especially the vine for wine-making, and experiments on irrigation plantations have been carried on on a large scale at Renmark on the lower Murray and elsewhere.

The only promising branches of farm work at present seems to be fruit-growing and dairy-farming. Vine-growing is particularly promising, but the price both of grapes and of wine is low, and the market is uncertain.

It is not too much to say that the whole future of South Australia as an agricultural colony depends on irrigation, and to this fact the government appears to be fully alive. Beyond the limits of the counties, many artesian wells have been sunk, though the water is unfortunately often of poor quality, owing to the saline matter with which the soil of the arid region is impregnated. An elaborate system of storage reservoirs has also been made along the great stock roads, by which cattle and sheep are driven to the seaports.

The camel is extensively employed both as a pack and a draught animal, and is bred in the colony. The ostrich has also been introduced experimentally; and where the desert of the interior is irrigated by wells, date-palms have been found to thrive.

Minerals.—The mineral products consist mainly of copper ore. The copper mines north of Adelaide were once a great source of wealth, but they are now rarely in full work, as the fluctuations in the price of copper frequently reduce the value of the metal below the cost of profitable production. A little gold is found here and there, and small deposits of silver have also been worked; but as yet no sensational finds of the precious metals have been made in South Australia. The large export of silver-lead ore is simply transit trade from the Broken Hill mines in New South Wales.

Conditions and Prospects.—There is a high protective tariff on imports. The land-system is similar to that in the other Australian colonies, but there is a tendency to encourage the leasing rather than the sale of public lands. The conditions of tenure vary with the nature of the land. Pastoral leases in the arid region, for instance, are obtainable at a rate of not less than 2s. 6d. per square mile for twenty-one years, with the obligation to stock the land with five head of sheep or one of cattle per square mile within three years.

Taken altogether, South Australia is not at present a promising field for enterprise, either for the settler or the capitalist; but its resources are considerable, and the effect of extending irrigation, and the stimulus of the federation of Australia or the discovery of paying gold may effect a great change in a short time.

CHAPTER XVI.

AUSTRALIA—TASMANIA.

Position and Surface—Communications—Climate—Mineral Resources—
Farm Produce—Population and Immigration—New Lands of Tas-
mania—Prospects.

Position and Surface.—The island of Tasmania is nearly as large as Ireland, possesses many of the characteristics of the scenery of Scotland, and a climate nearly approaching that of England. It lies 120 miles south of the colony of Victoria, from which it is separated by Bass Strait.

The island is bordered on the east coast by a range of mountains, the highest summit of which barely exceeds 5000 feet. This is followed by a depression running right through the island from north to south, through which the Macquarie River runs north to the Tamar estuary and the Jordan River south to the estuary of the Derwent. West of this, the whole of the island is occupied by a plateau ridged by mountains and furrowed by valleys. A great part of the surface is over 3000 feet above the sea, and the highest mountain exceeds 5000 feet. Geologically the island is composed of Palæozoic rocks very rich in metallic ores and coal.

Communications.—The three best natural harbours are furnished by the Tamar estuary on the north, Macquarie Harbour on the west, and the estuary of the Derwent on the south.

Communication is kept up by steamers at frequent intervals from Melbourne to Launceston on the Tamar, and the steamers from Europe to New Zealand *via* the Cape of Good Hope call at Hobart. Internal communication is well developed, and all parts of the island may be reached by train or coach. The main railway runs through the great valley from Hobart to Launceston, a distance of 133 miles. From this line branches run up the central plateau, and to various points on the north coast and to one on the east. From Macquarie Harbour there are two short lines to the mining centres, but the whole north-western corner of the island is still without railways.

Climate.—Tasmania lies between 40° and 44° S., and is thus the most temperate of the Australian colonies; it is on this account growing in favour as a summer resort amongst the well-to-do citizens of Melbourne and Sydney. The average sea-level temperature for the whole island is about 64° in January and 45° in July; but on the higher parts of the plateau it is considerably cooler in summer and much colder in winter. The extreme recorded temperatures at Hobart are a maximum of 100°, and a minimum of 30°. It may thus be said that the summer is rarely hotter than a warm summer in the south of England, while the winter is rather milder, and far less damp, than that of the south of Ireland. The rainfall is everywhere sufficient for agriculture, and at a few points even excessive. Tasmania lies in the zone of the westerly winds, and the west coast is consequently very wet, rain falling at all times of the year. The total fall over the western half of the island exceeds 40 inches in the year, and in the north-west approaches 80 inches. A rainfall under 30 inches is only met with on the eastern slopes of the central plateau and in the great valley.

Some parts of the plateau are too moist to be profitable for either agriculture or stock-raising; but at the time of its discovery practically the whole island was densely wooded, and there are still very extensive forests of fine timber.

Mineral Resources.—No one staple predominates in Tasmania. Judged by the exports, the most valuable products are minerals—copper, gold, silver, tin; pastoral products, especially wool; and agricultural produce, particularly potatoes and fruit, together with a considerable quantity of timber.

Tin, which is smelted at Launceston, is produced in large quantities in the north of the island. Coal of good quality is mined at Fingal in the east, in the Derwent valley, and elsewhere. It is used throughout the colony, but the output could if necessary be considerably increased. Gold is found at many places in the island, the most paying mines at present being those at Mount Lyell, reached by rail from Macquarie Harbour. They have not produced great “rushes” at any time, but yield a steady production. Silver and silver-lead are mainly produced at Zeehan, to which a railway runs from Macquarie Harbour, and the whole of the adjoining region is richly metalliferous. Copper has, since 1896, been mined and smelted in the Macquarie Harbour district to such an extent that in 1898 this metal was in value the leading Tasmanian export.

There is a bar at the mouth of Macquarie Harbour which prevents large steamers from entering, and the development of

the district is now demanding extensive works to improve the entrance.

Farm Produce.—The live-stock of the island have not materially increased of recent years. Sheep to the number of about 1,600,000 are pastured in the drier part of the country, mainly on the eastern slopes of the plateau. Though not numerous the quality of the wool is fine, and the rearing of pedigree rams for export to the other colonies is of importance. Only 242,000 acres of arable land were under crop in 1897-98, but the quantity is steadily, if slowly, increasing. One-third of this area is under wheat, though the yield is not yet sufficient for local consumption. Oats, potatoes, and fruit, especially apples and pears, rank next in importance. The average yield of wheat, 15 to 20 bushels per acre, is very good for land that is not systematically manured. In addition to these crops, 226,000 acres are under sown grasses for hay.

Population and Immigration.—In 1890 the population of Tasmania was 146,667; at the beginning of 1899 it was estimated at 177,000. The death-rate is very low, about 13 per 1000; and as the birth-rate is high, the population is increasing naturally at the rate of 2700 per annum. For several years there was no increase by immigration, but the average annual excess of immigrants over emigrants in the four years 1894-97 is officially estimated at 2500. The number of people leaving the country is, however, believed to be considerably underestimated, so that the increase from the arrival of newcomers is less than would appear. The aborigines have been entirely exterminated by war and ill-considered attempts to confine them in definite districts, so that there is now no native problem. There are some Chinese in Tasmania, but their introduction is now prohibited.

The only towns of more than 2000 inhabitants are the capital, Hobart (with, including suburbs, 33,400 inhabitants in 1891), and Launceston, with 21,300.

New Lands of Tasmania.—The only necessities which will always have to be imported into Tasmania are the produce of tropical plantations; all varieties of European grain and fruits can be grown, and all the necessary minerals occur in large quantity. Of the $15\frac{1}{2}$ million acres of the main island and the $1\frac{1}{2}$ million acres of the small islands adjacent, only 5 million acres have as yet been alienated, although a considerable part of the remainder is leased as sheep-runs. The best parts have been taken up, and practically all the good agricultural land which remains is very heavily timbered and costly to clear.

There are Crown Land offices in Hobart and Launceston where applications for grants have to be made. The minimum price charged to selectors is £1 per acre, which may be paid for at once, or, the purchase price increased one-third, may be paid by instalments extending over fourteen years. Grazing land is let by auction at an upset rent of 5s. per 100 acres for fourteen years; but this land may be resumed by the Crown at six months' notice on payment of compensation.

A miner's right costs 5s. per annum, and entitles the holder to prospect and mine for gold and tin. Leases of not more than 10 acres of auriferous land are granted by the Crown for not more than ten years at a rent of not less than £1 per acre; but land containing other minerals may be leased for longer periods at prices varying from 2s. 6d. to 5s. per acre per annum.

The right to cut timber and strip wattle bark on Crown lands is acquired on the payment of from 2s. 6d. to £1 per month as licence, according to the nature of the timber cut, for each man employed.

Prospects.—The prosperity of a colony such as Tasmania depends on the continuous development of the country by a steadily but not too rapidly increasing population. Capital is much wanted for the development of the mines and the extension of the railways; but a great deal can be done by energetic men with only a little money. The excellent fisheries round the coast could be enormously developed, for the supply of Hobart and Launceston (and by means of ice or refrigerated steamers for Melbourne and towns on the Australian mainland), while curing for export might prove profitable. The colonial fish markets would have to be organised as well as the fisheries. Dairy farming and jam-making on a large scale could also be extended; and there appears to be every inducement for the establishment of workshops for the manufacture of block- and sheet-tin utensils in the neighbourhood of the smelting works, where water-power might be largely utilised.

The tourist and summer visitor traffic, to which reference has already been made, might be encouraged by the organisation of more good hotels in the picturesque lake district of the central plateau, where the summers are delightfully cool and grateful to visitors from the hot cities of Australia.

The *Tasmania Handbook* of the Emigrants' Information Office is very optimistic as to the possibilities of the island. It says:—“If fewer large fortunes have been made, if labour is not quite so highly paid as in some other colonies, nowhere, probably, does the mass of the population live in greater ease and comfort.

It is seldom difficult for anyone to find work of some kind or other, though at times he may have to shift his quarters to obtain it. The delightful climate of Tasmania, its beautiful hills and valleys, its abundance of water, its flowers and hedgerows, would seem to offer more attractions to British settlers than the hot summers, the long droughts, and endless plains of many parts of Australia. There is perhaps no colony which offers so many advantages to a man of small income who is in search of a comfortable home, an equable and temperate climate, and pleasant society. Though the manufactories are still very small, capitalists will find continual opportunities for investing in fresh undertakings."

Yet we know men who have gone out to Tasmania with their families, resolved to settle, and after three months left the island in despair of obtaining a permanent home with remunerative work. A certain amount of experience in the sort of work likely to present itself in a new country is always necessary for a settler, and it is still more necessary to give a sufficiently long trial to any change of one's surroundings in order to recover from the shock inseparable from an entirely new environment.

CHAPTER XVII.

WESTERN AUSTRALIA.

Position and Coasts—Surface—Climate—Mineral Resources—Farming—Population and Immigration—Communications—Mining Laws—Land Divisions—Land Laws—New Lands for Agriculture—Mineral Lands—Tropical Goldfields—Murchison Goldfields—Yilgarn and Coolgardie Goldfields—Mount Margaret and Dundas Goldfields.

Position and Coasts.—Western Australia is the largest of the Australian colonies, but contains the smallest population. It occupies the whole of Australia west of the meridian of 129° E., and is bounded by the sea on north, west, and south, the whole area being 976,000 square miles. In spite of its great length of coast-line, the colony has few seaports, although there are probably many excellent natural harbours in the north. In the south the chief ports are Fremantle, on the Indian Ocean at the mouth of the Swan River, which has been artificially improved so as to admit the largest vessels; and King George Sound, close to the south-west corner, a most commodious natural harbour, forming a convenient calling-place for vessels coming from the Suez Canal to east Australian ports. East of this the coast is formed by the long line of harbourless cliffs surrounding the Great Australian Bight.

Surface.—The river system of Western Australia is confined to a mere fringe of land bordering the west and north coasts. The south coast and the whole vast interior are without permanent rivers, and large areas are still entirely unexplored. A series of hills, nowhere attaining a greater height than 1500 feet, and known as the Darling Range, runs from the south-western corner of the continent northward for several hundred miles, parallel to the coast and at a distance of about 20 miles from it. Beyond the Swan River the land rises and the range stands further back, leaving a broad coastal plain crossed by numerous rivers. North of De Gray River in 20° N. a broad stretch of low tropical desert separates the temperate part of the colony from the well-watered tropical lands of the far north.

The interior of Western Australia is for the most part a flat or undulating plateau of Palæozoic rocks, with an elevation exceeding 1000 feet above the sea level, dotted with great lakes, which are beds of salt-encrusted mud for most of the year and very shallow sheets of water for a month or two. Isolated mountains and lines of hills diversify this desert country, but the greater part of it is made up of plains of drifting sand, heaped into dunes, and bearing only scanty clumps of shrubs about the water-holes, or else the peculiar desert grass known as spinifex, the scattered tufts of which resemble groups of bayonets, and are even dangerous for horses to tread on.

The plains in the south, sloping to the cliffs of the Bight, are grassy in summer after the rains have fallen, but they are frequently parched with the long continued droughts to which the land is liable.

The country to the south-west and along the west coast, south of the tropic, is, in its natural condition, covered with wood, the forests being of great extent, and the trees extremely valuable as timber.

The surface as a whole is not sufficiently diversified by mountain ranges or river valleys to offer serious obstacles to the construction of roads and railways, or to determine the directions in which the means of communication must run. The one controlling natural condition, which bears on every aspect of economic development, is the excessive drought of the interior and the consequent precariousness of the water supply.

Climate.—Western Australia enjoys a climate somewhat cooler, on the whole, than that of the same latitudes in the east of the continent. The climate of the south-western corner is like that of southern Victoria. The temperature in summer frequently rises above 90° F., but a cool sea breeze blows almost every afternoon, penetrating some distance inland. The average summer temperature at Perth is 75° (January and February), and the average winter temperature about 55° (June to August). In Albany it is a few degrees cooler. The greater part of the annual rainfall takes place in winter, from May to October, the rest of the year being nearly rainless. The total fall in the higher ground of the south-west slightly exceeds 40 inches in the year, and a belt in which the rainfall exceeds 30 inches extends from some distance east of Albany to some distance north of Perth. Towards the interior the rainfall diminishes so rapidly that an average of 10 inches in the year is scarcely anywhere found as far as 150 miles inland, and in the interior

there is the usual capricious variation of the scanty precipitation which is characteristic of Australia as a whole.

Mineral Resources.—Until very recently the development of Western Australia was so slow and the population so small that the natural resources of the colony had hardly been touched, and it is yet difficult to say, on account of the still imperfect surveys, of what the country is capable. The discovery of great areas of gold-bearing quartz reefs in the interior of the colony has led to gold-mining becoming the leading industry and gold the chief export. In 1891 the amount of gold exported was worth £115,000; in 1897 it had risen to £2,565,000, and in 1899 to £6,247,000. In 1897 all the other exports put together only amounted to half the value of the gold. The number of men employed in gold-mining in that year was close on 18,000, so that the yield corresponded to £143 per head of those employed. Gold is found in almost all parts of the interior from north to south wherever the country has been prospected, the great obstacle to its economical production being everywhere, except in the extreme north, the want of water. The imports into Western Australia have for the past few years been almost double the value of the exports. This is due to the inclusion of large quantities of railway plant, mining machinery, wearing apparel, and materials for food and drink. Half the trade, both exports and imports, is done with the eastern colonies of Australia, and almost all the rest with the United Kingdom direct.

Farming.—Stock-raising comes next in importance to mining, the colony containing about 2,000,000 sheep, pastured mainly on the grassy country of light rainfall bordering the absolute desert. The value of the wool exported averages about £250,000 per annum. Timber is the only other important export. It consists partly of sandalwood, sent for the most part to China; but mainly of the fine hard woods of the south-western district, known as karri and jarrah, which are largely used for building and as wood paving. The forests are extensive, and if properly managed should increase in value.

The sudden increase of population consequent on the development of the goldfields has made the agriculture of the colony insufficient to provide enough food, so that flour, oats, butter, beer, &c., are being imported in large quantities. Only 133,000 acres were under cultivation in 1897-98, of which 81,000 were under hay, 38,700 under wheat, and the rest under oats, barley, and potatoes. The average annual rainfall in the wheat-growing area is about 18 inches, and the average yield of grain varied in

the ten years previous to 1898 from about 8 to 14 bushels per acre. Vine-growing has been profitably introduced, and the olive, and many other fruits of southern Europe flourish exceedingly.

Population and Immigration.—The greater part of the immense area of Western Australia can never become habitable land, and over a considerable portion of the remainder only the wandering aborigines can make any sort of living, and that a miserable one. The tropical, pastoral, and plantation regions of the north will, on the other hand, support a fairly large population; the south-western corner of the colony may ultimately become very densely peopled, and the desert goldfields, as long as they remain productive, will maintain a large population by the importation of all the necessities of life.

In 1891 the population of the whole colony, exclusive of wandering aborigines, was only 49,782; but immigration, consequent on the gold discoveries, has been so rapid that the population in June, 1899, was estimated at 168,480, the bulk of this increase being derived from the eastern colonies of Australia. Immigration in 1897 exceeded emigration by 22,600, and in 1898 by 3953. The rate of natural increase, however, is smaller than in other Australian colonies, the death-rate being higher and the birth-rate lower. Although the country is as healthy as any in the same latitudes in any part of the world, the sanitation of the towns is in many instances far from satisfactory, and even in Perth the *surveys* for an adequate system of sewerage were only completed in 1896.

There are rather more than 5000 civilised aborigines employed in the colony, mainly as servants and stock-riders. The immigration of Chinese and other Asiatics is essential to the success of the mining and other industrial operations in the northern section, where they number about 1900; but their entrance is not permitted in any part of the colony south of 27° S. Other prohibited immigrants are people unable to read and write, paupers, and, it is written, anyone who within three years has been convicted of a felony or infamous crime.

The cost of living in Western Australia is higher than in the other Australian colonies.

Communications.—The port of Fremantle at the mouth of the Swan River is the calling place of the North German Lloyd steamers, and is connected by rail with the capital Perth (population, with suburbs, in 1897, 37,900) 12 miles further up the river. Perth is the centre of the railway system, the chief lines radiating from it to the south, east, and north. A line runs

from Perth to Albany (338 miles), the calling place of the British mail steamers; another, due east from Perth, passes through the goldfields surrounding Coolgardie (300 miles) and Kalgoorlie, sending a branch north to Menzies. The Midland Railway runs northward to Geraldton (319 miles), whence a line runs north-eastward to Cue, the centre of the Murchison goldfield, a further distance of 262 miles. A line also passes south from Perth along the coastal plain to Busselton on Géographie Bay (150 miles), traversing the great timber region. The railways are being steadily extended; beyond their termini communications are kept up by mail-coaches. There is a very extensive telegraph system, while coasting steamers establish communication between all parts of the seaboard.

Mining Laws.—There is a fairly high customs tariff on almost all imports, and the usual regulations as to the liquor trade, hours of work, employers' liability, and the employment of women and children prevalent elsewhere in Australia are in force. Education and vaccination are compulsory, and every occupier of land is obliged to destroy all rabbits on his holding, otherwise government inspectors may do so by means of poison.

Licences for cutting timber cost from 5s. to £3 per month per man, according to the nature of the timber cut, and timber leases are granted for twenty-five years up to an area of 75,000 acres at an annual rent of £20 per square mile, one of the conditions of such a lease being that a sawmill must be erected on the land.

Miners' rights, entitling a man to prospect and mine for gold, cost 10s. per annum. The minerals in any land disposed of by the Crown for pastoral or agricultural purposes are always reserved. Leases of auriferous land may be granted for twenty-one years up to an area of 24 acres at £1 per acre annually, with, usually, the condition imposed of doing a certain amount of work on the holding. Gold may be worked on privately-owned land by paying compensation to the proprietors, while every proclaimed goldfield is placed under the jurisdiction of a warden.

Mineral leases for minerals other than gold are granted at very low rates, those for coal being only 6d. per acre per annum, with a royalty of 3d. per ton on the coal raised, increasing after ten years to 6d. per ton.

Land Divisions.—The country is divided for land purposes into six divisions, viz. :—

1. *The South-western*, bounded on the east by a line drawn from a point on the Murchison River 90 miles from the sea to

Doubtful Island Bay in the south. It comprises practically all southern Western Australia, which has an annual rainfall exceeding 18 inches.

2. *The Western Division* occupying the coast from the Murchison River to latitude 23° S. and extending eastward to the meridian of 119° E.

3 and 4. *The North-western and Kimberley Divisions* occupying nearly the whole of the tropical part of the colony.

5. *The Eucla Division* occupying the south coast; and

6. *The Eastern Division* comprising the central stretch of the colony up to the South Australian boundary, including the most extensive deserts of Australia.

Land Laws.—Land may be held by various tenures, and is granted by the Lands and Survey Office in Perth, which is under the charge of the Minister of Lands. Altogether, at the end of 1897, about 9,000,000 acres (out of the 624,600,000 acres of which the colony is made up) had been or were in process of being alienated. 915,000 acres were held under the tenure of conditional purchase, and 87,000,000 acres were held on pastoral leases. Formerly the leased area was much greater, but of late the pastoral industry has not been in a progressive state. The various methods of acquiring land in Western Australia are as follows:—

Conditional Purchase.—In specially proclaimed agricultural areas of the South-western District only, from 100 to 1000 acres may be obtained by anyone over the age of eighteen, on payment of not less than 10s per acre, the payment extending over twenty years. One-tenth of the land must be fenced within two years, and the whole within five, while within ten years a sum equal to the whole purchase money must have been expended in improvements, and double this sum must be expended unless the holder resides on the land for six months out of each of the first five years. After five years, and on completion of these obligations, the land belongs to the holder as soon as the whole purchase price has been paid. Neglect of these conditions may lead to forfeiture.

Conditional purchase may also be effected without residence at a rate of not less than 10s per acre, payable within twelve months, and subject to the condition of fencing the land within three years and spending 5s per acre on it within seven years.

The planting of vineyards or orchards in the South-western Division, or within ten miles of a town anywhere, is encouraged by the sale of blocks of from 5 to 50 acres at not less than £1

per acre, payable within three years, and subject to conditions of fencing and cultivation.

Free homestead farms of not more than 160 acres are granted in the South-western Division or within 40 miles of a railway in the Eucla or Eastern Divisions by any person not owning more than 100 acres of land in the colony who is prepared to pay a fee of £1, reside for at least six months in each year for five years on the land, and spend not less than £30 in buildings or improvements, as well as fencing the whole within seven years and cropping one quarter of it. The property in the homestead is secured without payment only after seven years' occupation.

Working-men's blocks of 5 acres are sold at £1 per acre, payable over ten years, and subject to residence, fencing, and improvement.

Grazing lands can be purchased at much lower rates (6s. 3d. or 3s. 9d. per acre, according to quality), but under similar conditions. Poison lands form another category. They are lands infested by plants of the genus *Gastrolobium*, poisonous to livestock, and peculiarly deadly to sheep. They are let on a thirty years' lease in blocks of from 300 to 10,000 acres at a purchase price of 1s. per acre, payable in instalments over the thirty years, and when the conditions of paying the cost of a survey, fencing, and eradicating poisonous plants have been fulfilled, the land becomes the property of the lessee.

Pastoral Leases are granted in all the Divisions, for large areas of land, the minimum being 3000 acres in the South-western Division and 20,000 in the others, at annual rents varying from 2s. 6d. per 1000 acres in the Eastern Division, 5s. in Eucla, 10s. in the Western, North-western, and Kimberley Divisions, and 20s. per 1000 acres in the South-western. The highest rent charged works out at less than $\frac{1}{4}$ d. per acre; but the conditions attached to a pastoral lease are the stocking of the land within five years with 10 head of sheep or one of large cattle per 1000 acres, or the expenditure of a certain sum in improvements. All pastoral leases terminate in the year 1928.

New Lands for Agriculture.—The South-western District alone need be considered in this respect; but as it is well watered, larger than the United Kingdom, and its population equal to that of a rural market town in England, it is obvious that there is scope for a large increase of population. The great and growing goldfields, situated as they are in a region as impracticable for agriculture as the Klondike, require to be supplied, and in 1897 nearly a million pounds worth of products

which might and ought to have been grown in the colony were imported. No doubt very profitable market-gardens might be established near or in the goldfields if irrigation could be secured, but the cost of water for primary purposes is so great that there are very few places indeed where a supply could be obtained for the land. In the Eucla division the harbour of Esperance (237 miles by sea from Albany) is connected by a coach-road with the Dundas and Norseman goldfields 126 miles to the north; and as the rainfall within 15 miles of the coast is believed to be sufficient, the neighbourhood might probably be profitably developed by market-gardeners. There is land open for selection, and the cost of clearing is comparatively low, being from £1 to £2 10s. per acre.

In the river valleys of the northern part of the South-western Division there is good agricultural land, but the climate is much hotter than in the south. At Mullewa on the railway from Geraldton to the Murchison goldfield at Cue there is an area open for selection. This area promises a good market, as in addition to the comparative proximity to the goldfield there is a lead- and copper-mining district at Northampton, north of Geraldton. The land costs from £3 to £4 per acre to clear.

The valley of the Irwin River, in the country traversed by the Midland Railway from Geraldton to Perth, contains rich agricultural land, in which coal-seams also promise future development, but there is no land at present open for selection. Nearer Perth much of the country near the railway is well suited for fruit-growing, but as most of it belongs to a land company which charges the high price of from £2 to £3 per acre, little has been sold.

The railway which runs east from Perth opens up a considerable agricultural area about Northam, where selections may be made. This is a very important district, as it is the nearest farming land to the Yilgarn and Coolgardie goldfields, where the demand is large and prices high. The railway southward to Albany runs through fine farming land, with a rainfall ranging from 14 to 26 inches a year. As a rule, wells have to be sunk and tanks constructed to ensure a water supply. This is the chief wheat-growing region in the colony, and large areas of Crown lands are still open for selection. Most of the new land is wooded, and requires to be cleared at a cost of from £2 to £3 per acre. As this railway runs along the watershed of the country it affords access to the fertile valleys running to the west and the south-east.

The coastal plain south of Perth is a prosperous region

capable of great development. It is of very fair fertility, and lies between the immense forests of the ranges and the small ports whence the timber is shipped. The principal coal deposits of the colony are worked in the valley of the Collie River in the south, and the coal is shipped at Bunbury, where there are Crown lands open for selection. In this region there are also deposits of tin and other minerals which only require capital for their development.

Between Bunbury and Albany there is a stretch of well-watered hilly country, densely wooded with jarrah and karri and possessed of a very rich soil, but the clearing for agriculture is so costly as to be prohibitive at present unless the timber can be sold. When the forests are once cleared by the timber companies the cultivation of the soil cannot fail to be very profitable.

In the South-western District it would appear to be worth while to spend money in the development of fruit-growing for export. Vine-culture and wine-making already pay well and can be greatly extended. Experiments show that the olive flourishes and that silk-worms may also be reared; olive oil is easy to manufacture and commands a high price when of guaranteed purity, and the demand for silk is never likely to slacken. Hence these industries ought to be given a fair chance to develop by the introduction of an Italian colony and the offering of a bounty on native productions.

Mineral Lands.—The rapid prospecting of the deserts of the Eastern Division has proved the existence of an immense quantity of gold, chiefly in the form of quartz reefs, which occur at intervals in all parts of the country from south to north, frequently on the margins of the great granite intrusions which form a feature of the geology of Western Australia. The chief goldfields which had been proclaimed up to the end of 1898 were as follows :—*

Tropical Goldfields.—The *Kimberley Goldfield* in the extreme north contains valuable reefs which cannot be profitably worked on account of the remoteness of the region, the cost of communications, the extreme heat of the climate, and the difficulty of obtaining either machinery or labour. The total production in 1898 was only 228 ozs. of gold.

The *Pilbarra Goldfield* on the north-west coast is also a tropical field. Its chief centre is Marble Bar, on a tributary of

* The information here given is derived mainly from Gordon & Gotch's *Australian Handbook*, 1899, and from the Emigrants' Information Office *Western Australia Handbook*, 1899.

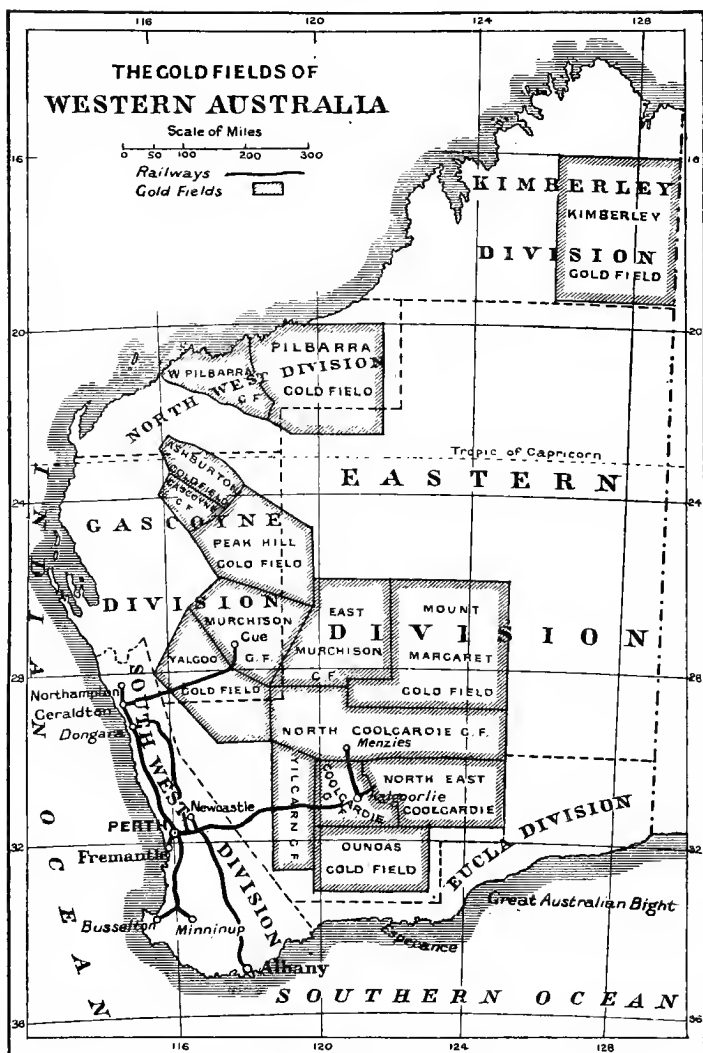


Fig. 7.—The Western Australian Goldfields.

the De Grey River, about 80 miles by coach from Condon in latitude 20° S. Condon is reached by local steamer from Cossack, which is in steamer connection with Fremantle. New deposits of alluvial gold are frequently discovered, and there are good quartz reefs. The total production in 1898 was 13,641 ozs. of gold. Water is found at depths of from 40 to 120 feet. Prices of all necessaries are very high, and miners' wages run up to £5 per week.

The *Ashburton Goldfield*, reached by a journey of 200 or 300 miles from the port of Onslow at the mouth of the Ashburton River, was opened in 1890 for alluvial workings, but is now unimportant.

The *Gascoyne Field* lies just to the south of the Ashburton, and was declared open in 1897, the chief workings being at Bangemall, 260 miles north-east of the port of Carnarvon. It is promising, on account of its valuable reefs.

The *Peak Hill Field*, adjoining the two goldfields just mentioned, was also opened in 1897, and is reached, *via* Nannine, from the railway terminus, Cue, on the Murchison Field, about 150 miles to the south. It has been very productive in alluvial gold, forming what is called in miner's language "a poor man's field." The total yield in 1898 was 13,736 ozs.

The remaining goldfields lie well south of the tropic, although they are all intensely hot in summer, but with a dry heat which, outside the insanitary towns, is very healthy. The towns have sprung up very quickly without any attention being paid to the disposal of sewage, a more than usually serious problem in a waterless land.

Murchison Goldfields.—The great *Murchison Field* has been worked since 1891, and is now in railway communication with Perth by the line running east from Geraldton to Mount Magnet, and thence north to Cue. The chief centres of gold production are Mount Magnet, Day Dawn, the Island, Nannine, and Cue. Both alluvial and reef gold are worked, and the supply from the reefs promises to become permanent. Timber for use in the mines is scarce, but water is generally abundant, and there is a good deal of pastoral land on the goldfield carrying sheep. The total output for 1898 amounted to 133,231 ozs., the yield being second only to that of Coolgardie.

The *Yalgoo Field* is crossed by the Geraldton to Cue Railway. It was proclaimed in 1895, and is a pastoral as well as an auriferous country. Copper ore has also been discovered.

The *East Murchison Field* lies between the Murchison and the Mount Margaret goldfields, and its chief centre, Lawler, in the

south is reached from the railway terminus at Menzies, 130 miles to the south.

Yilgarn and Coolgardie Goldfields.—The *Yilgarn Field* is nearest the administrative centre of the colony, the station of Southern Cross on the Coolgardie Railway, which forms its chief town, is only 237 miles east of Perth. It is a typical mining town of the desert, the water supply being obtained by distillation from the brine wells. In some parts of the goldfields around this centre there is a fair supply of natural water, and the field as a whole is promising mainly for quartz-mining. The total output in 1898 was 11,696 ozs.

The richest of the goldfields is that of *Coolgardie*, which produces fully three-quarters of the West Australian gold, and enjoys the same position in Australia as Klondike does in Canada or Johannesburg in South Africa. Gold was discovered in 1891, and the goldfield proclaimed in 1894. The town of Coolgardie contained 13,000 inhabitants in 1898. It lies in the centre of the richest quartz mines, and in 1898 deep alluvial gold was discovered within the boundaries of the town itself. Not only gold, but almost all other minerals (including lignite) occur, though they are not yet worked. The town is 310 miles by rail from Fremantle and 528 miles from Albany, but the single line of railway has often proved insufficient to carry in the necessary supplies and machinery, and the construction of another line to the harbour of Esperance on the south coast, a distance of only 200 miles in a straight line, is in contemplation. The sanitary condition of this and the other towns of the desert require improvement, and all prices are very high. Water is sold on the desert goldfields like any other commodity, and its supply is a serious problem. Coolgardie town is served partly by means of condensed water obtained from brine wells, the deepest Artesian borings (3000 feet) having failed to strike fresh water, and partly from tanks in which the scanty rainfall is preserved. The latter in 1897 was only $5\frac{1}{2}$ inches. A great water scheme has been projected, with the object of bringing a supply in pipes from the hills near Fremantle. Rapid as the progress of the mines has been, the arrival of miners has been more rapid still, and the supply of labour often exceeds the demand. Kalgoorlie (25 miles from Coolgardie by rail), in the *East Coolgardie Field*, is rapidly approaching Coolgardie in size, and is in the midst of even richer mines. It is probably the richest goldfield in Australia. Kanowna, or White Feathers, 12 miles north-east of Kalgoorlie by coach, is the centre of the *North-east Coolgardie Field*, and has the advantage of timber in the surrounding

country and possesses characteristic desert lakes. It is in the neighbourhood of extensive deposits of alluvial gold. Menzies, 80 miles by rail from Kalgoorlie, is the chief town of the *North Coolgardie Field*, and has the advantage of drawing its water supply from wells. There will probably be many more towns of importance established upon these fields, where, undoubtedly, much gold has yet to be discovered. Altogether, the Coolgardie goldfields produced in 1898 no less than 773,473 ozs.

Mount Margaret and Dundas Goldfields.—The *Mount Margaret Field* lies north of the North Coolgardie, and east of the East Murchison Fields. It was proclaimed in 1897, and contains good reef gold worked at the centres, Mount Margaret and Mount Malcolm. Mount Malcolm is 64 miles north of Menzies, and Mount Margaret is a few miles further east on the shore of the salt Lake Carey. The total yield from this field in 1898 was 43,264 ozs.

The *Dundas Field* lies south of Coolgardie, and its chief centre, Norseman, is reached either from that town (111 miles) or by coach from Esperance (126 miles). There is abundant reef, though little alluvial, gold, and if water could be secured for irrigation the country might become important agriculturally. The production of gold in 1898 was 32,032 ozs.

Prospecting in the desert regions is very trying, and even dangerous, work. Camels have to be employed for transport, unless the routes across the desert are chosen so as to follow the water-holes known only to the scattered tribes of aborigines. The extreme heat of the day is often followed by sharp cold at night, and the rock is in many places concealed under a great depth of drifting sand.

CHAPTER XVIII.

NEW ZEALAND.

Position—Configuration and Geology—Climate—Population and Immigration—Legislation—Land laws—Mining laws—Resources of New Zealand—Pastoral Products—Agriculture—Minerals—Forests and Fisheries—Manufactures—Towns and Communications—Possibilities of New Zealand.

Position.—New Zealand consists of two large and several small islands lying in the Pacific Ocean about 1300 miles south-east of the east coast of Australia. The group lies within the parallels of 34° S. and 47° S., projecting further into the temperate zone in the southern hemisphere than any other land except the extremity of South America. It is included between the meridians of 166° E. and 179° E., the island being almost exactly on the opposite side of the Earth to Great Britain, and the time consequently differing by nearly twelve hours. Thus noon in England corresponds nearly to midnight in New Zealand. From the positions of the islands in the southern hemisphere it is summer in Europe when it is winter in New Zealand.

Configuration and Geology.—The group consists of two large islands named North Island and South (or Middle) Island, while the much smaller Stewart (formerly called South) Island lies at the extreme south. North Island, with an area of nearly 44,500 square miles, has a straight and nearly unindented coast on the west towards Australia, the few openings which occur being ill-suited for harbours. The east coast is richly indented, especially in Hauraki Gulf in the north, where the excellent harbour of Auckland is situated. The main feature of North Island is its volcanic character, there being several great volcanic mountains, the highest, Ruapehu reaching 9100 feet in height; and amongst the low ranges of the interior of the island there are remarkable hot lakes and thermal springs. Earthquakes frequently occur, but are rarely severe. The Carboniferous formation containing coal measures occurs in several parts of the island, and in the more ancient rocks quartz veins yielding gold are found.

The South Island has an area of 58,500 square miles, and is

separated from North Island by Cook Strait, 13 miles wide. The lofty range of the Southern Alps runs along the west coast; the higher summits are permanently snow-capped, and form glaciers. Roads can only be carried across the range at a few points, so that the rugged west coast remains much isolated from the extensive undulating plains which stretch from the eastern base of the mountains to the Pacific coast. Grand fjords wind deeply into the land in the south-west of the island, but these are valueless as harbours because the deep inlets are backed by impassable mountains. The harbours in the north of the west coast are poor, and on the east coast the only good natural harbours are those of Lyttleton and Port Chalmers. The south-west of the island contains magnificent mountain scenery and fine lakes; but the whole eastern half of South Island may be looked upon as one great pastoral plain, many parts of which are being broken up for agriculture. The plain is well watered by rivers flowing across it from the mountains to the sea; and New Zealand differs in this respect, as in so many other particulars, from the Australian colonies.

The geology of South Island displays a great development of the ancient sedimentary rocks in the west, including very important outcrops of the coal-measures and auriferous quartz. Other mineral resources are also abundant.

Climate.—North Island has a considerably warmer climate than any part of England. The average temperature in January (the hottest month) is from 65° to 68°, and in July (the coldest month) from 48° to 55°. Temperatures over 80° are not common in summer, and frost at sea-level is very rare in winter. South Island approximates in climate to England. The January temperature averages from 58° to 65°, and that in July from 40° to 48°. Extremely high temperatures are rare, and frost and snow are sometimes experienced even at sea-level; a minimum temperature of 23° has been observed at Lincoln in the Canterbury district.

New Zealand is a country of high winds, especially South Island, which lies entirely in the belt of prevailing westerly winds. The rainfall along the west coast is consequently very heavy, exceeding 75 inches per annum along the whole western slope of South Island (where, at Hokitika, it averages 118 inches), and exceeding 50 inches for the west of North Island. The shelter afforded by the Southern Alps provides the eastern slopes of South Island with a rainfall which, while everywhere sufficient, in a normal year does not exceed 30 inches. In North Island the lower and less regularly scattered highlands permit

of a more uniform distribution of rainfall, few parts of the island having less than 40 inches of rain annually.

The climate is pleasant and exhilarating at all seasons, and the death-rate of New Zealand is probably the lowest in the world, rarely exceeding 10 per thousand of the population for the whole country.

Population and Immigration.—The population of New Zealand at the census of 1896 was 743,214. With the exception of about 40,000 aboriginal maoris (most of whom live in North Island) and 3700 Chinese, the population is almost exclusively of British origin. The further immigration of Chinese is subject to government restrictions, and the usual restrictions are also in force against the introduction of undesirable Europeans.

The population is well scattered over the country, not concentrated in large towns as in Australia. The existence of four towns of approximately equal size—Auckland, Wellington, Christchurch, and Dunedin—each with from 40,000 to 60,000 inhabitants, provides a number of centres of activity no one of which greatly preponderates over the others, and Wellington, the political capital, is the smallest of the four.

The excess of arrivals over departures averaged 3600 per annum for the seven years 1892-98, and the population is increasing by the natural excess of births over deaths at the rate of 11,800 per annum. The government no longer offers direct encouragement to immigration, but there is room and there are resources in the country for the support of a very much larger population.

The maoris, living mainly in North Island, are diminishing in numbers, and a colonial estimate gives the year 1930 as that by which the race will be practically extinct. They take readily to work of various kinds, and have ceased to be a cause of serious trouble to white colonists. They are of a race superior in physique and in culture to the Australians, and are capable of education. There are maori members in both Houses of the colonial parliament.

Legislation.—New Zealand is a self-governing colony, in which democratic principles probably have fuller expression than in any other country in the world. There is universal suffrage for all persons over the age of twenty-one; women have the same right to vote as men, but may not be elected as members of either House. The maori members are elected by maoris alone, with a special franchise. Members of both Houses are paid. There is stringent legislation as to the employment of women and children, the regulation of factories and mines,

holidays, and the hours of closing of offices and shops. The liquor traffic is subject to local option. Workmen have privileges as to security for wages and compensation for injuries, and there are special enactments for conciliation and arbitration in the case of labour disputes.

Old age pensions have been introduced, by which every person over sixty-five years of age who has resided for twenty-five years in New Zealand, and has not been a serious criminal, is entitled to receive £18 a year from the public funds; but if his income otherwise exceeds £34 a year, the pension is reduced so as to make up the total income to £52. Thus no one possessing a private income of £1 a week receives any pension.

Dogs can only be imported subject to six months' quarantine at the importer's expense, and there are restrictions on the importation of all live-stock. There is a protective tariff which is high on certain products, running up to 40 per cent. of the value.

Land Laws.—The land laws of New Zealand are designed to encourage the principle of State ownership, with security of tenure to the occupant. There are three modes of tenure for Crown lands, one of which must be chosen by the selector. These are—(1) Cash payment and the acquisition of the land in freehold; (2) occupation under lease for twenty-five years with a right to purchase; and (3) a lease in perpetuity. The Crown lands are divided into three classes—Urban, Suburban, and Rural—each of which is sold by auction, although rural lands may also be obtained by application after the land has been declared open for selection, the holder, if there should be more than one applicant, being chosen by ballot. The area which may be acquired by any individual is limited in each case; no rural section can exceed 640 acres of first-class or 2000 acres of second-class land. Larger areas of pastoral land can, however, be secured on lease. There are ten land districts, corresponding to the provinces, and principal land offices are situated in the following towns:—Auckland for Auckland, New Plymouth for Taranaki, Napier for Hawkes Bay, Wellington for Wellington, Nelson for Nelson, Blenheim for Marlborough, Christchurch for Canterbury, Dunedin for Otago, Invercargill for Southland, and Hokitika for Westland. All negotiations for the acquisition of Crown lands have to be conducted through the land office of the division in which it is situated. The price of Crown land varies greatly according to situation and quality. The rent of land held with option of purchase is 5 per cent., and that of land held on a perpetual lease is 4 per cent., of the cash price. In both cases residence and improvements are required.

Special arrangements are made for the establishment of village settlements, in which homesteads are granted at a very low rent.

Small grazing-runs are let at a rental of $2\frac{1}{2}$ per cent. of the capital value of the land, which must not be less than 5s. per acre, and the area of such a run must not exceed 5000 acres of first-class or 20,000 of second-class land. Any selector may hold only one such run, and cannot hold it together with a pastoral run.

Pastoral runs are let by auction on lease for not more than twenty-one years, subject to resumption by the Crown at a year's notice. The holders are obliged to exterminate rabbits and prevent the spread of such shrubs as gorse, broom, and sweet-briar. No right is acquired by a pastoral lease to the soil, timber, or minerals. The maximum area of any run varies in different districts, the general rule being that it should not be greater than is sufficient to carry 20,000 sheep or 4000 cattle.

Mining Laws.—Miners' rights for prospecting and working minerals on Crown lands cost 10s. per annum, with 10s. additional if the operations are carried out on native land. The maximum area of land held on a lease for minerals other than coal is 320 acres, the rental charged being 2s. 6d. per acre and a royalty of from 1 to 4 per cent. of the value of the output at the spot. The maximum length of lease is forty-two years. The area of land leased for coal-mining may be as much as 2000 acres, and the lease may be for as many as sixty-six years at a rental of from 1s. to 5s. per acre and a royalty of from 3d. to 1s. per ton.

Resources of New Zealand.—The total exports of the colony average about £10,000,000 per annum, of which animal products account for seven-tenths. The largest item is wool, worth over £4,000,000; the next, frozen meat (chiefly mutton), worth £1,600,000. Products of the mines yield rather over £1,000,000 of exports, practically all gold. Products of the forest and agriculture yield about £1,000,000 worth of exports between them. The chief forest product is the remarkable semi-fossil resin kauri gum which is dug out of the soil in some parts of the North Island.

Pastoral Products.—Looked at from the point of view of productions, New Zealand is mainly a sheep-rearing country, but, unlike most new countries, it has acquired a reputation not only for wool but for carefully-fed mutton also. In 1898 there were 19,673,000 sheep in the colony, mainly in the east of South Island and in the south and east of North Island. The

pastures of New Zealand are mainly sown with European grasses. In its native state the land was covered with ferns of many varieties and a coarse tussock grass, growing in tufts and of inferior quality for grazing purposes. The fern having been burnt off, good pasture grasses can be easily grown, and in 1898 there were over 10,000,000 acres of artificial pasture in use.

Cattle are kept (to the number of 1,200,000 in 1898) chiefly in the provinces of Auckland and Wellington in North Island, and Taranaki and Otago in South Island. Dairy farming is increasing in importance, the large trade in frozen meat making the transport of frozen butter easy and cheap.

Although the country is well adapted for horse-breeding, the number of horses exported from New Zealand has been falling off.

Agriculture.—Agriculture is annually increasing in importance, but the area of land under crops varies greatly from year to year. In 1898-9 there were 399,000 acres under wheat, a total that was more than the average of recent years, but less than it once was. There were 417,000 acres under oats, and 416,000 acres under turnips. Potatoes also form a large crop. By far the greater part of all these crops are raised in the provinces of Canterbury and Otago in South Island. There is a small export of oats and potatoes, but wheat, which was a comparatively large export up to 1892, has now to be imported to supplement the native supply for home consumption.

The yield per acre of all crops in New Zealand is exceptionally high, and the labour of farming is claimed to be lighter than in most countries on account of the favourable climate, kindly soil, and the absence of disease in plants or animals.

Minerals.—The gold production of New Zealand is fairly steady, and the amount obtained from quartz veins is increasing, although more than half the yield is still got by alluvial workings. The most productive goldfields are in Auckland, Otago, and on the west coast. The introduction of gold-dredging machinery on the rivers has proved very profitable, but the apparent yield of gold per miner is curiously small. Divided amongst the 14,200 miners engaged, the annual yield of £1,080,000 would only furnish £76 per head.

The output of coal reached 900,000 tons in 1898, and is steadily increasing. It does not quite suffice for the demand, about 110,000 tons requiring to be imported yearly. The chief coalfields now being worked are on the west coast of South Island, and in Otago; but there are other fields in Auckland and Nelson.

Small quantities of silver, antimony, copper, manganese, and sulphur are worked; but there does not seem to be any large supply of iron ore, although immense deposits of rich titaniferous iron sand are found at Taranaki and elsewhere on the coast. These were formerly worked for export, but are now somewhat neglected.

Forests and Fisheries.—Of the forest products by far the most important is the kauri gum, obtained by digging over the sites of the once extensive forests of kauri pines. A considerable wood industry also exists in Auckland, the kauri and other pines forming admirable timber.

The fisheries are not much developed, but are decidedly promising. The rivers are stocked with trout and other fish brought from Europe, but native species of much value for food abound round the coast, and there is some trade in fish to Australia. The New Zealand oysters form an increasingly important export.

Manufactures.—Manufactures of all kinds are encouraged by the protective tariff. The chief industrial establishments, apart from those employed in building-construction, &c., are those engaged in meat-refrigeration. There are also important tanneries, butter and cheese factories, and flax mills engaged in spinning phormium or native hemp. Textile manufactures have not yet developed as might have been expected. The damp climate of the west coast of South Island and the convenient coal supply would seem to point to the profitable establishment of cotton mills. Raw cotton could be produced in Fiji and other Pacific islands within easy reach of New Zealand. Woollen textiles might also be manufactured on a larger scale than is the case at present; but fluctuations of price and other causes frequently check growing industries. The manufacture of phormium, for instance, was formerly a flourishing industry, employing 3200 hands in 1891, but fell to only 647 in 1896, while the exports fell from £380,000 to £30,000.

Towns and Communications.—The chief traffic between the coast towns of the colony is carried on by sea. Coasting steamers visit all the small ports, and larger vessels sailing from Auckland southward call at the chief ports on their way to Melbourne; while vessels bound for Sydney call at the ports on their way northward along the east coast. Steamers of several companies from England round the Cape of Good Hope have their terminus in New Zealand ports, and return to Europe *via* Cape Horn. There is also direct communication between Auckland and Vancouver or San Francisco.

The railway system in neither island can be looked upon as complete, although it is already fairly extensive. From Auckland



Fig. 8.—New Zealand.

the railway runs only 120 miles to the south, the central part of the island, mainly occupied by the maori lands being not yet

crossed by a line. From Wellington on Cook Strait there is railway communication northward to New Plymouth in Taranaki on the west coast, 220 miles; and to Napier on Hawkes Bay on the east coast, 180 miles.

In South Island the south-eastern half of the island is well supplied with railways. From Dunedin a line runs 230 miles northward to Christchurch and continues 70 miles farther north. A line runs south-eastward from Dunedin for 140 miles to Invercargill and Bluff Harbour at the extreme south, and numerous branch lines cross the plains of the province of Canterbury and ascend the valleys of southern Otago. Some of these are destined eventually to unite with the short lines on the west coast, where Hokitika and Greytown are already connected, and communicate with the gold and coalfields in their neighbourhood. The gaps in the railway system are filled by excellent coach-roads, which form a wonderfully complete network over the colony, and are being pushed into the outlying districts in advance of colonisation. Indeed, the government of New Zealand has been reproached with extravagance in spending so much on roads, railways, surveys, and other public works. From the point of view of the scientific geographer such a reproach is the highest praise for intelligent foresight.

The Possibilities of New Zealand.—New Zealand is the most favourable region in the world for the creation of a second and improved Britain. The islands are, in many respects, even more favourable for the development of a self-supporting nation than those of the old country; the climate is better, and the soil more fertile. New Zealand is not handicapped by any stain of convict colonists, but was settled by men of high character. The two chief towns in South Island were, indeed, religious in their origin, Dunedin having been founded in 1848 by the Free Church of Scotland, and Christchurch, two years later, by the Church of England. This accounts for the fact that the streets of Christchurch are named after cathedral cities in England, while those of Dunedin repeat the street names of its parent city, Edinburgh. The bold experiments in legislation initiated by the New Zealand Government have freed the country from the hampering influence of tradition and insured an equality of chances for all comers.

Although wages are not so high, nor the possibilities of making individual fortunes so great as in other new countries, the cost of living is proportionally low, and no industrious worker can become destitute. The possibility of New Zealand becoming a great centre of trade for the Pacific, and the certain

of its becoming an important tourist resort on account of the unique interest and beauty of the scenery of both islands must not be forgotten. New branches of agriculture and industry may be profitably introduced. Experiments with ostrich-farming, olive, and wine-growing in Auckland give promising results; European flax can be grown everywhere, and the sugar-beet is looked upon as a crop of the future for southern Otago. The extensive forests, covering about 20,000,000 acres in 1896, are in danger of being destroyed by the increase of settlement, but efforts are being made to promote tree-planting so as to ensure a supply of timber and to furnish a shelter from wind on the open plains.

There are still large areas of Crown land available for selection in all parts of both islands; but in the Canterbury plains the best has long since been taken up, and the land now available is rarely so easy to clear as the plains clad with fern, which only required to be burnt off to enable the plough to get to work.

Mining may be immensely developed by increasing the capital of the mining companies, and by opening up mineral resources other than coal and gold. The discovery of phosphates would be welcome to farmers, who are beginning to feel the want of fertilisers, the supply of which at present is practically limited to slaughter-house refuse.

For particulars of the character and particular resources of the various land districts the reader must be referred to the comprehensive *New Zealand Official Yearbook*, or to the short abstract published in the Emigrants' Information Office's *New Zealand Handbook*, both of which are published annually.

CHAPTER XIX.

THE RESOURCES OF SOUTH AFRICA.

South Africa—Configuration of South Africa—South African Climate—Fauna—Communications—People—Political Divisions—Prospects for the Future. Cape Colony—Position and Surface—Settlement—Eastern Districts—Northern Districts—Bechuanaland—Trade—Resources. Natal—Surface and Climate—Trade and Resources—New Lands in Natal. Transvaal—People and History—Surface and Resources—The Rand—Other Goldfields. Orange River Colony—General Conditions—Resources.

South Africa.—The lands of temperate South Africa present certain general resemblances to those of Australia and of temperate South America, but differ greatly from both on account of the high average elevation of the country, the absence of any dominant mountain range, and the large population of sturdy natives, who show no tendency to die out in contact with White civilisation. Another difference is due to racial difficulties between the White masters of the country. In Australia the British stock and the English language are supreme, and in South America the Spanish, but in South Africa representatives of many European nations meet without mingling. The strain between the dominant races—the British, politically the masters, and the Afrikaners, of Dutch descent and language, numerically superior—has led at the time of writing this book to a war of magnitude almost unexampled in British colonial history. The restoration of peace and the re-organisation of the territories immediately concerned will do much in the way of stimulating the utilisation of resources and the development of the country, and when these are complete, South Africa will undoubtedly become more valuable in every way than it ever was before. In the present circumstances a brief sketch can alone be attempted, indicating the natural resources, but not attempting to deal with the actual conditions. Fuller treatment will here only be accorded the Northern Division of the region (Southern Rhodesia), although it lies for the most part in the tropical zone.

Configuration of South Africa.—The uniformity of the coast-line of Africa south of the Zambezi is an index of the inaccessibility of the country. There is no good harbour on the west coast, from the tropic southward to Table Bay; while on the south coast there is no place where a steamer can unload in quiet water, except the artificial harbour of East London, and on the east coast, with the exception of the artificially improved harbour of Durban, Delagoa Bay is the only sheltered place where steamers can lie.

The interior of South Africa is a great plateau, rising from the sea by several steps, the steep edges of which resemble mountain ranges and act as such towards all approach from the seaward side. The plains between the successive mountainous slopes are termed *karroos* in Cape Colony, and the general Dutch name of *veld* (field) is given to all the plains, whether at a high or a lower elevation. The eastern edge of the plateau forms the Drakensberg mountains, between which and the sea in Natal there is much hilly and broken country. Towards the north, stretching to the Zambezi, the altitude of the plateau exceeds 5000 feet above the sea level. The flat surface of the *veld* is frequently broken by abrupt isolated hills termed *kopjes* (heads), of all sizes from 20 feet to over 1000 feet in height; but the *veld*, as a whole, is so flat that it offers no obstacle to the passage of wheeled vehicles, and thus the ox-waggon has become the characteristic means of transport over the length and breadth of South Africa, no roads being necessary.

The rivers run, as a rule, in deep gorges far below the general level of the country, and are of no value for navigation on account of waterfalls. The chief rivers are the Orange, flowing to the west coast, with the Vaal as one of its principal tributaries; the Limpopo, flowing to the east coast, with a great bend to the north, and entering the Indian Ocean north of Delagoa Bay; and the Pungwe, a small stream entering the Indian Ocean, and valuable as an inlet to the tableland which slopes northward to the great river Zambezi.

South African Climate.—The climate of South Africa is remarkably similar to that of Australia within the same limits of latitude. The south-east trade winds bring a considerable and steady rainfall to the eastward slopes of the plateau, but inland from the Drakensberg the whole of the *veld* is dry, and much of it arid, while in the west the dry pastures merge into the pure desert of the Kalahari. As in Australia, the climate is subject to great extremes. The low coast lands of the eastern

seaboard are usually swampy and malarious, conditions extending up the valleys of the rivers north of Natal, and combining with the prevalence of the tsetse fly to render that part of the country very unhealthy both for man and beast. But on the veld, and along the south coast, and even on the high plateau north of the Limpopo, the climate from its dryness and the exhilarating character of the air is extremely favourable to health. On account of the great elevation of the plateau the nights are always cool and often very cold, even in summer, while the latitude ensures intense radiation from the sun during the day at all seasons. Along the east coast the rainy season is the summer, the wettest months (which are also the hottest), being between October and March. In the north-western interior there is practically no rain, and any development of that part of the country must be of such a kind as to be independent of atmospheric moisture. The most temperate part of South Africa, along the south coast, receives most of its rain in the winter months, from May to August.

From these remarks it will be seen that the extreme south is favoured with a climate scarcely excelled in any part of the world, but that both the east coast and the far interior present certain conditions to which a European settler would require to become gradually acclimatised.

Fauna.—The whole of South Africa was at one time traversed by herds of big game, ostriches, antelopes of innumerable species, zebras, giraffes, elephants, rhinoceros, buffalo, and the lion. Smaller carnivora were also very abundant. The occupation and settlement of the country have driven almost all these animals north of the Orange River, and most of them are now only to be met with in any numbers north of the Limpopo. The ostrich alone has been domesticated, but the domestication of the zebra may be looked upon as being in progress of realisation. Sheep, cattle, horses, and Angora goats have been introduced, and flourish much as they have done in Australia and South America.

Communications.—Over most of the interior of South Africa the cumbrous ox-waggon is the most convenient means of transport, the traveller using the waggon as a house, and, if need be, as a fort. Rapid travelling is possible only on horseback, or, in the more settled parts where roads have been made, by mail coach.

The railway system of South Africa is still very incomplete, but its main outlines have been laid down. The chief railway runs from Cape Town north-eastward to Bulawayo in Rhodesia,

a distance of about 800 miles, and the extension of this line to and beyond the Zambezi, so as to make a central trade-route through the centre of Africa from south to north, is in contemplation. Short lines running north from Port Elizabeth and East London are connected with the main line by a branch on the Karroo south of the Orange River, and, converging north of that river, are continued through Bloemfontein and Pretoria towards the Limpopo. One line runs into the Transvaal from Durban, connecting with the main line at the junction for Johannesburg, and another railway runs from Lourenço Marques on Delagoa Bay to Pretoria. The only other important line in use also crosses Portuguese East Africa from the head of navigation on the Pungwe to Salisbury in Rhodesia, which will in time be reached from Bulawayo also. These railways from the east coast are important, because they enable travellers to cross the unhealthy coast belt rapidly, and so reach the healthy plateau without serious inconvenience.

People.—The native people of South Africa may be distinguished into two groups:—(1) The Hottentot and Bushman Tribes of the west, which are diminishing in numbers and importance, the former being now almost extinct; and (2) the Kaffir or Bantu Tribes of the east, who have spread over the greater part of the country, and are steadily increasing in numbers. Of the Kaffir tribes, the Zulus are the most powerful. The elements of population in all parts of South Africa are practically the same, viz.—a great number of natives forming a large reserve of cheap labour, and a small number of white men, for the most part of Dutch descent and speaking the dialect known as Cape Dutch. For the successful conduct of business in the outlying parts of the country, a knowledge of Dutch and of the Kaffir language is absolutely indispensable; but English suffices for the towns, even in those in which the majority of the inhabitants are of Dutch origin.

Political Divisions.—The political divisions of South Africa at the beginning of 1900 included six States:—(1) The Colony of the Cape of Good Hope, usually known as Cape Colony, or even "The Cape," a British self-governing colony, in which there was absolute equality for all white races, while debates in the Cape Parliament might be carried on either in English or Dutch. This extended north to the Orange River, and included Bechuanaland. (2) Basutoland, at the source of the Orange River, a small Crown colony in which the settlement of white people was prohibited. (3) Natal, a self-governing British colony on the east coast, including Pondoland on the south and

Zululand on the north. (4) The Orange River Free State, between the Orange and the Vaal, a republic of Dutch-speaking farmers (in Dutch, the word for farmer is *Boer*), in which white men could acquire citizenship and exercise full rights. (5) The



Fig. 9.—South African Railways.

South African Republic, or Transvaal, between the Vaal and the Upper Limpopo, a republic of Dutch-speaking farmers with a very large alien population attracted to the goldfields, to whom the Boer Government denied the rights of citizens except

upon impracticable terms. The two Boer Republics were not sovereign states, for their foreign affairs were subject to British control, although the nature and extent of this control was so badly defined by treaties or conventions that there were considerable differences of opinion on the subject. (6) The territory of the Imperial British South Africa Company, or Rhodesia, stretching from the Limpopo to the Zambezi, and connected to Cape Colony by a railway running close to the Transvaal frontier through a strip of ground belonging to Rhodesia, bordering the protected native territory of independent Bechuanaland under the rule of Khama and other chiefs.

The result of the war has been to put an end to the republics. The Orange Free State has been formally annexed to the British Crown under the name of the Orange River Colony, while the subjection of the Transvaal is also assured. For many years to come these territories must be administered as Crown colonies, the exercise of political rights by the people being limited until the loyalty of the mass of the population to the British Crown has been established.

With the exception of the Transvaal and Rhodesia, all South Africa formed a Customs Union within which there was free trade, and the same tariff and exemptions held good in all the constituent states of the Union.

Prospects for the Future.—The alliance between the two Boer Republics, and the invasion of Natal and Cape Colony by their armies in October, 1899, led to a state of affairs which has produced radical changes in the political status and government of South Africa, but as the problems to which they have given rise have not as yet been fully solved it is impossible to consider advantageously the conditions of settlement in any of the territories, except perhaps Rhodesia. The political changes will lead to administrative and economic changes which will greatly alter the prospects of intending settlers in the different parts of the country. The war ruined thousands of prosperous farmers, miners, engineers, and traders of all kinds, while thousands have lost their lives; and until peace has been not only restored but assured South Africa cannot recover its old prosperity. It will in the most favourable case be many years before the country will be again desirable for purposes of settlement, although to the adventurous and speculative a certain element of attraction may exist. The bitter race feeling aroused by the war—even if it does not spread to the blacks—will certainly require at least a generation of exceptionally wise government before it can be allayed. From the political point

of view the settlement of a large number of British farmers would be a wise and prudent proceeding, and it might be a sound investment of public money if encouragement were offered to settlement by the promotion of irrigation works on a large scale, and the selection of suitable settlers.

With regard to agriculture in South Africa, there is no part of the region except, possibly, Natal which can produce a sufficiency of food for its present inhabitants. The soil is, in most places, poor, and the plague of locusts frequently destroys a whole year's crops; while rinderpest has again and again swept away vast numbers, not only of domestic cattle, but of the wild herds as well. Only mineral wealth of the most valuable kind permits of settlements being made, the greater part of the supplies for which have to be brought from abroad, hence the only people likely to improve their position by going to South Africa are those skilled in mining and engineering, and those who are content to live by trade, acting as importers and retailers.

CAPE COLONY.

Position and Surface.—Next to Newfoundland and Canada, the nearest of the large colonies to the Mother Country is the Cape of Good Hope. The distance from Southampton to Cape Town is 6,200 sea miles, and the length of passage by mail steamer is from sixteen to eighteen days. The area of Cape Colony is more than twice that of the United Kingdom, and presents a great diversity of scenery, elevation, and climate. The richest part of the country is the south-east, near Cape Town, which is the chief harbour and the busiest seaport in Africa, except those connected with the Suez Canal.

The land rises in two great terraces, flanked with mountainous slopes, the first known as the Karroo, the second as the Great Karroo. East of Cape Town the land leading up to the lower slopes is abundantly supplied with rain and in large part covered with fine forests; but west and north-west of Cape Town and on the Karroos the climate is very dry and irrigation is necessary for agriculture.

Settlement.—The chief agricultural district is the Cape peninsula in the immediate neighbourhood of Cape Town. Here every kind of crop of the temperate zone can be raised, and there are extensive vineyards producing good wine. The chief wheat-growing district lies about 50 miles north of Cape Town. On the Karroo the farming is almost entirely pastoral, and sheep are the most important live-stock in the colony. The

chief forests lie along the coast between Knysna and Humansdorp, and from these a considerable quantity of timber is obtained. Behind the forest region, as far as Port Elizabeth, the country is well settled with farms growing grain, fruit, tobacco, and raising sheep, cattle, and ostriches; but there are no railways, and transport has to be by road.

From Port Elizabeth eastward to the Kei River the country is also well settled and agriculture is pursued, maize being the most important crop.

Railways from Port Elizabeth, Port Alfred, and East London run northward through the valleys and cross the Karroos to the Orange River. In this section of the colony there are many more settlers of British origin than in the west, but the farmers of Dutch race are also numerous. There are important coalfields in the Stormberg mountains, from which the eastern railways are largely supplied. The best harbour of this section of the colony is East London, 600 miles, or two days by sea, from Cape Town; but the most important towns are some miles inland. These are Grahamstown, on the railway between Port Elizabeth and Port Alfred, and King Williams Town, on a branch line from East London.

Eastern Districts.—Beyond the Kei River the Transkei territory inhabited by the Fingoes has not as yet attracted many white settlers, as it can only be reached by road, and considerable capital is required to start farms. It contains, however, some good farming land, and the cultivation of cotton has been experimentally introduced.

Tembuland on the east is nearly fully occupied, and is similar in character.

Pondoland in the extreme east is still practically unexploited, but it contains a considerable native population and is very inaccessible.

Between Pondoland and the Drakensberg is the small territory of East Griqualand, a fine pastoral country producing wool and horses, and with increasing agricultural prospects. Most of the land is already occupied, but the whites form only about one-fortieth of the population. This district is capable of great development if it had convenient transport, and a railway has been planned to cross Pondoland and terminate at the port of St. Johns, midway between East London and Durban.

Northern Districts.—The Karroos are, on account of their very dry climate, suitable only for live-stock, especially sheep; and the conditions of farming upon them are such that no newcomer could possibly compete with the Dutch farmers who have

for many generations been adapting their methods of work and manner of living to the peculiarities of the land. Where irrigation is possible the situation is entirely different, and any farmer or market gardener who can command one of the rare supplies of water ought at least to make a very comfortable living.

Griqualand West is a small province north of the Orange River, with railway connection to all the chief seaports. Its chief town Kimberley is situated in the celebrated diamond fields, the diamond mines being worked in a great vertical volcanic neck of serpentine. They have been consolidated, so that their control lies in a few hands. The work is very highly organised, and the output regulated so as to maintain prices and not outstrip the demand. Thousands of natives are employed to do the heavy work of mining, and these are kept close prisoners during their time of service in order to reduce the loss always occurring from the illicit sale of diamonds. A comparatively small number of white miners, overseers, and officials direct the work. There are a few small diamond diggings at various points along the Vaal River, but these do not seriously compete with the great monopoly. Kimberley forms an excellent market for agricultural produce, but the dryness of the climate handicaps farmers severely. Water on the farms has to be stored in tanks filled during the summer rains.

Bechuanaland.—Bechuanaland is still but little settled. It is pre-eminently a cattle-rearing country, agriculture being entirely dependent on irrigation, which is only possible at a few places. The native forests, never too extensive, are being rapidly depleted for the wood supply of Kimberley. The land along the railway is being taken up to a considerable extent for farms, but it is hard for a newcomer to compete with the Boers and Kaffirs.

The new district of Gordonia, bordering the Orange River, appears to offer some inducement for the investment of capital in irrigation-works, with a view to a return from agricultural produce and fruit. Pumping machinery is necessary, because the river runs in a steep-sided valley far below the general surface of the land, and there is still scope for the inventor to improve the methods in use.

Trade.—The exports and imports of Cape Colony have in recent years been mainly of goods in transit to the Transvaal. Thus taking the year 1898 the exports amounted to £25,300,000, of which over £15,000,000 consisted of Transvaal gold. The

largest item of colonial production was diamonds of the value of £4,567,000 ; the next wool, worth £1,766,000. The only other exports which exceeded the value of half a million pounds each were ostrich feathers and Angora hair.

The imports consist to the extent of one-half of articles for food and clothing, the rest being principally mining machinery, explosives, timber, &c., for the Transvaal. Wheat and meat are imported in large quantities from Australia and Canada, the agricultural resources of Cape Colony not having been able to respond to the enormously increased demand for the necessaries of life in the northern state.

British coinage, weights, and measures are used in Cape Colony and throughout South Africa ; but for agricultural purposes old Dutch units are used, of which the chief are the *morgen*, equal to about 2 acres ; the *leaguer*, about 128 imperial gallons ; and the *muid*, 3 bushels.

The laws are of Roman origin, derived through the Dutch and modified by statutes. The restrictions on the employment of labour and on trade are, on the whole, less severe than those in most British colonies. Education is not compulsory, but the number of illiterate whites is comparatively small.

Resources.—The live-stock on the farms of Cape Colony in 1898 included 13,000,000 sheep, 3,000,000 Angora goats, 1,200,000 cattle, and 268,000 ostriches. The grain crops consist mainly of maize ("mealies"), wheat, oats, and barley, but large quantities of millet or "kaffir corn" are raised by the natives.

The mineral resources of the country are mainly diamonds, which occur only in Griqualand West. Copper, which comes next in value, is mined at Ookiep in the north-west, but the annual production of ore does not exceed a value of £300,000.

Coal is mined at Indwe, Cyphergat, Molteno, and at other points in the Stormberg range, but the output is small and does not nearly suffice for the demand in the colony. Mining is particularly easy, as the coal seams crop out on the hill sides and can be worked by horizontal tunnels. In all the mines most of the work is done by natives, such white miners as are required being usually engaged in Britain and sent out under contract for a term of years.

Alluvial gold has been worked on a small scale in the south of the colony near Knysna and Prince Albert, and some prospecting has been done in Bechuanaland ; but so far no evidence of the existence of gold in payable quantity has been found. Iron and lead ores have been reported, but they are not worked. Some manganese ore is raised not very far from Cape Town,

and various ornamental stones adapted for jewellery have been discovered in different places. A prospecting licence for precious metals or for diamonds costs 2s. 6d. per month.

Fishing is carried on, largely by Malays, at various points on the coast. The government has at various times endeavoured to improve the fisheries, as well as the other resources, and a good deal of scientific study has been carried on with the object of developing the country in this respect.

Apart from the effect which the war may have in embittering race feeling, the development of the resources of Cape Colony always appears likely to present peculiar difficulties and to entail on pioneers hardships relatively greater than those prevailing in other temperate countries. The British Emigrants' Information Office *Cape Colony Handbook* for 1899 gives this advice to immigrants:—

“English farmers are recommended to become accustomed to colonial ways before investing in land; it is very doubtful whether even then they will make the production of grain pay. Local peculiarities of seasons, soil, pasture, management of stock and of native labour, as well as the Cape Dutch language, which is spoken by a large portion of the country population, can only be learnt by experience and study.”

NATAL.

Surface and Climate.—The self-governing British colony of Natal occupies the narrow plain along the east coast from 27° to 31° S., and the hilly rising ground stretching up to the Drakensberg range. The north-western part of the colony forming the upper basin of the Tugela is high country, much broken up into hills and valleys. North of the Tugela along the coast the country is known as Zululand and Tonga or Amatongaland. The total area of Natal is only 35,000 square miles, and the population was in 1898 estimated at 60,000 whites (mainly British, though including many Dutch), 60,000 Indians, most of them coolies brought from India for plantation work, and 723,000 Kaffirs, or native blacks.

Natal is reached from England by sea, it being 855 miles or three day's journey by mail steamer from Cape Town to Durban, the chief harbour. Durban can also be reached by steamers which ply along the east coast of Africa coming from Europe by the Suez Canal.

The climate is hot, wet, and almost tropical on the coastal plain where coloured labour is necessary in the plantations; but

on the higher lands of the interior it is much cooler, and the rainfall much less. Irrigation is necessary for agriculture in some places in the interior, although the valley bottoms are naturally fertile and the mountain slopes are well grassed. Altogether Natal is the best adapted for agriculture of all the political divisions of South Africa.

Trade and Resources.—The railway system is practically limited to a line from Durban, the one good port, through Pietermaritzburg, the capital, past Ladysmith, to the extreme north of the colony, whence it continues to Johannesburg in the Transvaal. Shorter lines run to north and south along the coast.

The exports of Natal amounted in recent years to a value of about £5,000,000 while the imports were worth about £2,000,000. Most of this, however, represents transit trade for the Transvaal goldfields. The chief exports from Natal itself consist of wool, coal, and a little sugar.

The mineral resources of the country are considerable, but they have not yet been seriously exploited except in the case of coal. Gold has been prospected for in the north, and has been found in small quantities, but the results do not at present promise any important result, and the small deposits of silver, copper, and lead ores that have been occasionally worked are of little account. Coal, however, occurs in considerable quantity and of fair quality in the Klip River District in the north of the colony, and has been mined on a large scale near Newcastle and Dundee, the export of coal having become fairly established in 1898. Iron occurs near the coal, but is not as yet manufactured. If blast furnaces could be erected the resulting industries would add greatly to the importance of the colony. The political re-organisation of South Africa will probably much increase the value of the coal-mines of Natal if the free interchange of commodities with the Transvaal is provided for.

The sub-tropical lands near the coast are laid out in sugar plantations, maize fields, fruit farms, and recently tea gardens have been added, but the cultivation of coffee and cotton has almost ceased. A good deal of wattle bark is grown for export as a tanning material. The market gardening trade is practically all in the hands of the Kaffirs and Indians with whom white men cannot compete. The cool, upland country is mainly devoted to sheep and cattle, very little wheat or other grain being grown.

New Lands in Natal.—A large area of land is necessarily set apart for the large and rapidly increasing native population ;

but a certain amount of Crown land is reserved for occupation by white men, and is sold at moderate rates on the instalment system. In 1897 over 61,000 acres were disposed of at an average price of 11s 6d per acre. The Emigrants' Information Office's *Natal Handbook* for 1899 gives the areas of Crown land now open for disposal as :—

(1) Dronk Vlei, Ixopo,	23,000 acres.
(2) Ulufafa River,	10,000 „
(3) Alfred County,	11,923 „
(4) Alexandra County,	8,000 „
(5) Weenen,	5,000 „
(6) Ingagane, Newcastle,	10,000 „

The position of these districts is as follows. Nos. 1 to 4 are in the extreme south, out of reach of railways, Weenen is in the centre of the colony just south of the Tugela, and Ingagane is in the extreme north-west in the neighbourhood of the coal-mining district.

As a large importation of food-materials which could quite well be produced in the colony goes on, there is obviously an opportunity for farmers of the right stamp to make a comfortable living.

THE TRANSVAAL.

People and History.—The region between the Vaal and Limpopo Rivers, which up to 1900 was occupied by the South African Republic, is possessed of the greatest mineral wealth in South Africa. Before the mines were opened, the country was inhabited almost exclusively by farmers of Dutch origin, descendants of the first conquerors and settlers of Cape Colony, with a considerable infusion of French blood, but all speaking Cape Dutch. These people, being of simple habits and with few wants, had not kept pace with the advance of European civilisation since the seventeenth century, but by many generations of life under the hard conditions presented by the South African veld, they had acquired the power of making a living by agriculture and stock-raising. The descendants of the British settlers at the Cape, who came in in the first quarter of the nineteenth century when the colony ceased to be a Dutch possession, could also thrive by farming north of the Vaal; but it was only in rare cases, and after great hardships that a newcomer from Europe could make both ends meet.

When the mineral wealth of the Transvaal was discovered, a great influx of miners of every race in Europe took place and

the Boer Government, treating the situation from the point of view of the advantages accruing to their own race, endeavoured to raise revenue from the mines which they did not care to work, and, at the same time, to prevent the foreigners (in Dutch, "Uitlanders") from obtaining a share in the government of the country. The difficulties which resulted led to war with the United Kingdom in October, 1899, and on the re-establishment of peace, there must be a radical change in the conditions under which the exploitation of the country will be carried on.

Surface and Resources.—Speaking generally, the altitude of the Transvaal (the area of which is nearly equal to that of the British Islands) is between 4000 and 5000 feet. Some of the ridges rise to much higher elevations, while the valleys in the east, and especially in the north-east are much lower. The climate on the plateau is everywhere good, and the health of the dwellers in the country is remarkable. The new and often overcrowded towns suffer, like similar towns in all parts of the world, from outbreaks of disease due to bad sanitary conditions and careless living. The population was estimated in 1898 at about one million, 345,000 of whom were whites, and probably less than 100,000 of these were burghers or citizens of the republic. The largest town, Johannesburg, contained in 1896 a population of over 102,000, half of them whites. The majority of the Uitlanders were British subjects, but all European nations were represented, and over 10,000 of the inhabitants of the Transvaal were Jews.

The production of gold, which was worth £10,000 in 1884, exceeded £1,000,000 in 1889, and increased rapidly from £8,600,000 in 1896 to £16,000,000 in 1898; the Transvaal having become the greatest gold-mining country in the world.

There are other mineral resources which will doubtless become important in the future, but for the present the mining of silver, copper, and lead has been practically abandoned. Diamonds are found in different parts of the country, but only in small numbers, and can not compete with the output of Kimberley. Iron exists, but its practical utilisation lies in the future. There is, however, a good deal of coal, the value of which is great as fuel for the railways and for the vast amount of machinery employed in the goldfields. The principal coal mines are worked on the Witwatersrand, and the total output of coal in the Transvaal in 1898 was 1,900,000 tons.

Gold.—Gold occurs in three different forms. Alluvial gold is found in the valleys of the eastern mountains, but comparatively little attention has been paid to it, and it is believed not

to be present in any great amount. The second mode of occurrence is in quartz reefs, from which the metal has to be extracted by crushing and chemical processes. These reefs occur here and there in almost all parts of the east of the Transvaal among the mountains bordering the edge of the plateau. The third and most remarkable of the gold deposits is the *banket*, characteristic of the south of the Transvaal. This is a conglomerate containing lumps of quartz and other rocks cemented together by a siliceous matrix. It crops out along the most elevated part of the Transvaal in the ridge known as Witwatersrand, to which it has given such importance as to make "The Rand" signify, not any ridge, but that particular line of heights alone. The chief peculiarity of the *banket* is that it does not contain gold in rich patches here and there as quartz reefs and alluvial gravels do, but in a uniformly diffused form, so that every part of the mass contains gold in approximately the same proportion. Being able to count upon a continuance of the yield, the mining companies can afford to erect the elaborate stamping batteries, chemical extraction plant, and smelting furnaces which are required, with far greater probability of a return than from even the best quartz reef. This accounts for the phenomenal development of the Rand; the solid growth of Johannesburg, and indirectly, but no less certainly, for the renewal of the historic strife between the Dutch and British races in South Africa.

The Rand.—Johannesburg is situated at an elevation of 5600 feet above the sea, and although of very recent growth (founded in 1886) it has been for years, and will long continue to be, the most important centre of wealth-production in all Africa. It is the railway centre of the Transvaal, whence lines radiate to Cape Town (1014 miles), East London (666 miles), Durban (483 miles), and Delagoa Bay (395 miles to Lourenço Marques). The mines extend along the Rand for over 40 miles from Krügersdorp on the west to Boksburg on the east, and coal occurs, and is worked as well as gold. From the Rand goldfields extend to the south-east at Heidelberg, and to the north-west at Blaauwbank in the province of Rustenburg, which is said to be the richest and pleasantest agricultural district in the Transvaal.

The Rand contributed 94 per cent. of the gold raised in the Transvaal in 1898, and its prosperity is in large measure the cause of the comparative neglect of the other goldfields.

Other Goldfields.—The Klerksdorp goldfield in the south-west on the Vaal River has quartz of a low grade which makes the profit of working small, but a good deal of work has been

done upon it. It is reached by rail from Johannesburg through Potchefstroom.

The De Kaap goldfield in the east, along the north of which the Delagoa Bay railway runs, has been worked for a good many years, and its chief centre, Barberton, to which there is a branch line, was an important town before Johannesburg existed. Although now in a much less prosperous condition than it once was, this goldfield contributed 2 per cent. of the yield in 1898.

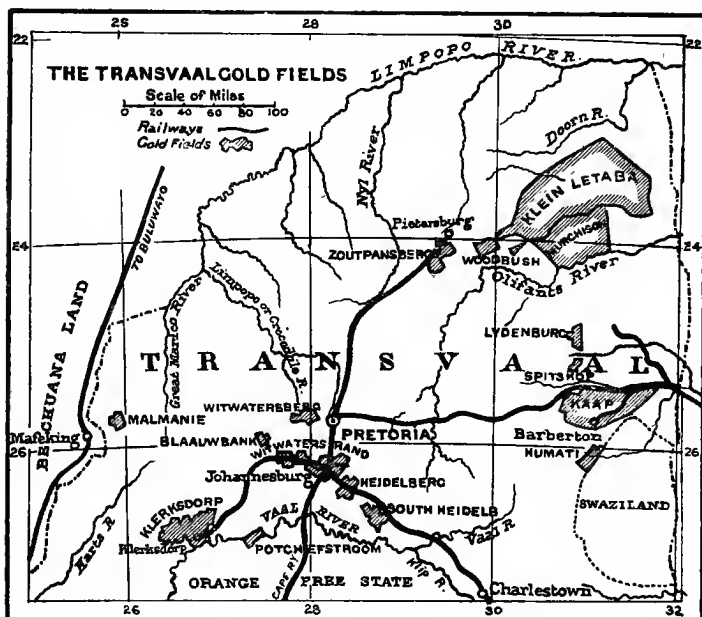


Fig. 10.—The Transvaal Goldfields.

The Lydenburg goldfield north of the De Kaap will be opened up by a branch from the Delagoa Bay line running north to Leydsdorp. At Pilgrims Rest it was the first goldfield in the Transvaal to be seriously worked, but its development has been retarded by lack of communications. As the Lydenburg country contains coal, silver, lead, and other minerals in addition to

gold, its future is promising, and in 1898 it ranked next to the Rand for the value of its output.

More to the north, the Zoutpansberg goldfields, including those of the Klein Letaba and the Murchison range, have been prospected with encouraging results; and with the railway extended northward to Pietersburg, they can be developed with some prospect of success, although the climate is hotter and less healthy than that of the southern fields.

Near Zeerust, not far from the frontier of Bechuanaland, promising signs of gold have been reported at Malmanie; and although at present this district is inaccessible on account of its distance from the Transvaal railways, when the frontier difficulty has been overcome it will find a short and easy outlet to the Mafeking-Kimberley line.

Further development of gold may also be looked for to the north of Pretoria, where a *banket* reef has been found; and in that district diamonds are also reported.

THE ORANGE RIVER COLONY.

General Conditions.—The territory between the Orange and Vaal Rivers, now known as the Orange River Colony, is a high plateau similar to the Upper Karroo of Cape Colony and the High Veld of the Transvaal. The climate is good, and the land very healthy. Except in the neighbourhood of the Caledon River in the east, where agriculture can be carried on without irrigation, the country is devoted to pasturage. The Colony has an area of about 48,000 square miles, and a population of about 200,000, of whom, in 1890, 77,000 were whites. The majority of the whites are of Dutch descent, but the Government of the Orange Free State was well administered, and never inflicted disabilities of the kind common in the Transvaal on foreigners residing in its territory. One reason of this may be that there never was a great influx of uitlanders, such as occurred at Johannesburg, and the Boer administration was not subjected to the same strain. Such an event might very easily have happened, for the diamond mines at Kimberley were on the borders of the Orange Free State, but when they were discovered the district of Griqualand West was, by various negotiations, annexed to Cape Colony.

Resources.—Several fairly productive diamond fields exist within the boundaries of the Colony, the most productive being at Jagersfontein, north of the Orange River. There does not

appear to be much gold, although there are alluvial workings in the mountainous region of the south-east bordering on Basutoland. The coal mines of the north are valuable, and promise to increase in importance. They occur south of the Vaal River at Viljoen's Drift, Heilbron, and Kroonstad, all on the main line of railway which crosses the State from Cape Colony to the Transvaal. The development of the country by completing the railway system by an east to west line from Natal to Kimberley will greatly improve the commercial outlook in the Orange River Colony, and agriculturally it may become an important adjunct to the mineral wealth of the Transvaal.

CHAPTER XX.

SOUTHERN RHODESIA.

British South Africa Company—Development of Rhodesia—Railways—
Surface and Resources—Climate—Gold.

British South Africa Company.—From Bechuanaland and the Limpopo River northward to the Zambezi, the whole vast area between German South-West Africa and Portuguese East Africa is known as Southern Rhodesia, and, with Northern Rhodesia, which lies beyond the Zambezi, was pacified and opened up for settlement by the British South Africa Company. The government and administration of the territory is carried on by the Company under the control of the High Commissioner for South Africa, assisted by a Council, some members of which are elected by the white inhabitants. Appeals from the decisions of the law courts of Rhodesia may be made to the courts of Cape Town, and finally to the Privy Council in London.

The British South Africa Company, with a capital of £5,000,000, has pursued the policy of Mr. Cecil Rhodes, its founder, in pacifying, controlling, prospecting, and opening up the country by means of roads, railways, and telegraphs. Since 1888 this policy has been pursued against great difficulties; agriculture has been retarded by the devastations of locusts, and stock-raising by the rinderpest, while, largely as a result of those visitations, the natives have risen in rebellion and have been reduced to order, effectually indeed, but not without much difficulty.

Development of Rhodesia.—It has not yet been proved that the land will repay the immense outlay of capital that has been necessary; but the gold mines from which much is expected only commenced to work in 1898, and it will be some years before their value can be determined. It appears doubtful whether agriculture and stock-raising would pay a British or American farmer. Many Boers from the Transvaal and some English Cape Colonists have established themselves on

farms in the southern part of the territory and succeeded in making a living from them. These successful farmers had, however, been accustomed all their lives to conditions of a similar kind, and were thus aided by accumulated experience. At present Rhodesia is a country only to be developed by the wealthy company whose object it is to undertake the work, and by subsidiary companies to which special concessions have been made. For private efforts it can only be recommended to men who are pioneers by nature, to whom the hardships and adventures of a country only now being won from barbarism are an attraction, who can afford to spend some years before reaping any return from their labours, and who can resist the temptations to drink and riotous living which have proved the destruction of so many white men in Africa.

Railways.—The Cape Government Railway reaches Bulawayo, the largest town and the capital of Matabeleland, the southern division of Rhodesia, 1600 miles from Cape Town. It is to be extended along the watershed of the country, 280 miles north-eastward to Salisbury, the second town in size, and the capital of Mashonaland and of the whole of Rhodesia. Salisbury is already connected by rail with Beira in Portuguese East Africa, a port 380 miles distant. When completed, the railway system will extend to, and beyond, the Zambezi, and a line will also be built through German South-West Africa to a port on the Atlantic. Such a complete opening up of a new country has never previously been attempted, and the preliminary surveys have convinced the directors of the South Africa Company that the land is worth the tremendous effort.

Surface and Resources.—The area of Southern Rhodesia (not including the Bechuanaland Protectorate) is between 140,000 and 170,000 square miles, and the population is estimated at about half a million. Of these, perhaps, 12,000 are whites, the rest being natives of the country.

The character of Southern Rhodesia is thus described by Mr. F. C. Selous:—"The surface of the elevated belt consists of open undulating grassy downs. To the north and west they slope gradually towards the Zambezi and the northern Kalahari Desert, little or no open country being met with near the watershed, but the open grass-land gradually gives place to continuous forest on the lower slopes. On all other sides the high plateaux are bounded by a belt of broken country, which varies in breadth from 20 to 50 miles. In the south-west (Matabeleland) this belt may be described as hilly, and there is a fall of some 700 or

* *International Geography* (Newnes), p. 998.

800 feet in a distance of from 20 to 30 miles; but in the east (Mashunaland) the descent to the low plains which border the east coast and extend up the valley of the Zambezi becomes abrupt and of a mountainous appearance. From the Inyanga Plateau to the lower valley of the Pungwe there is a fall of over 5000 feet in less than 100 miles.

"The highest portions of the plateau are granite, but on the slopes to the north, north-west, south, and south-west ranges of hills of different formation run through the granite, and amongst them numerous gold-bearing quartz-reefs occur. On the value of these reefs the speedy development of the country must largely depend. The whole of the high plateau is well watered, the more easterly portions being intersected in every direction by innumerable small streams, which are fed from springs welling out from the head of almost every valley on the open downs. Most of these never run dry even in the driest seasons, being probably supplied from underground reservoirs in the granite, in which great quantities of water are yearly stored during the rains. Anomalous as it may seem, the highest portions of the plateau of Southern Rhodesia are thus the best watered, though they are not dominated by mountain ranges. The innumerable small streams of the highest part of the downs gradually collect into brooks, and these converge to the main rivers which drain the country, and finally reach the Zambesi, the Limpopo, or the Sabi."

Climate.—The climate on the low ground is tropical, and malaria is common in the low river valleys. On the plateau, above 4000 feet, the climate is excellent, the temperature in summer rarely exceeds 100° F., and the heat is not trying. In winter the nights are cold, and in the highest parts of the plateau quite frosty. Both Bulawayo and Salisbury stand well above the 4000 feet level, and the country is perfectly suited for Europeans. The winter is dry, or with light rain, but heavy rains occur in the southern summer, from November to March. The rainfall is capricious, and varies greatly from year to year; observations have not yet been carried on long enough to allow the average to be calculated.

The whole of the plateau is admirably adapted for cattle and sheep rearing, if only the epidemic diseases could be checked. The South Africa Company are doing a great deal by means of inoculation to introduce a breed of immune cattle into the country, and to establish ranching on a large scale.

During the dry season, all European crops and vegetables can be grown by the aid of irrigation; but grain crops cannot be

depended on during the rainy season, as they are apt to suffer from disease.

Lions sometimes constitute a danger, as the reduction in number of the big game on which they used to prey drives them to the cattle yards. An effort is being made to preserve the elephant and the other large animals, which have been hunted nearly to extinction.

Gold.—The mineral resources, on the exploitation of which the success of the country, from the white man's point of view, depends, include gold, silver, copper, iron, coal, tin, plumbago, and siliceous earth. In present conditions, only the gold need be considered. The ancient richness of Mashonaland in this metal is attested by large remains of old workings, and the country is thought by many to be the Scriptural Ophir. Hitherto these old workings have been the chief guide to prospectors, but as detailed surveys are being carried out it will probably be found that gold-bearing strata are much more extensive. In the year ending August, 1899, the crushing of 116,000 tons of quartz yielded 63,000 oz. of gold, worth £225,000. This was the first year of serious working. The yield was from the mines at Gwanda, Selukwe, and Bulawayo only; but the reefs in other parts of the country are being opened up, and machinery is being erected to deal with the ores.

The annual reports of the British South Africa Company contain a great deal of information regarding Rhodesia, and anyone contemplating proceeding to that territory would do well to apply for information to the company at 15 St. Swithin's Lane, London, E.C.

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